Issued November 1970

SOIL SURVEY
Litchfield County
Connecticut

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
CONNECTICUT AGRICULTURAL EXPERIMENT STATION
and
STORRS AGRICULTURAL EXPERIMENT STATION

Major fieldwork for this soil survey was done in the period 1953–65. Soil names and descriptions were approved in 1966. Unless otherwise indicated, statements in this publication refer to conditions in the county in 1965.

This survey was made cooperatively by the Soil Conservation Service, the Connecticut Agricultural Experiment Station, and the Storrs Agricultural Experiment Station. It is part of the technical assistance furnished to the Litchfield County Soil Conservation District.

Either enlarged or reduced copies of the soil map in this publication can be made by commercial photographers, or they can be purchased on individual order from the Cartographic Division, Soil Conservation Service, USDA, Washington, D.C. 20250.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms and woodlands; in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for agriculture, industry, and recreation.

Locating Soils

All the soils of Litchfield County are shown on the detailed map at the back of this publication. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with a number on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information. This guide lists all the soils of the county in alphabetic order by map symbol and gives the capability classification of each. It also shows the page where each soil is described and the page for the woodland group and urban group in which the soil has been placed.

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the discussion of the woodland groups.

Foresters and others can refer to the subsection "Use of Soils as Woodland," where the soils of the county are grouped according to their suitability for trees.

Game managers, sportsmen, and others can find information about soils and wildlife in the subsection "Use of Soils for Wildlife."

Community planners and others can read about soil properties that affect the choice of sites for nonindustrial buildings and for recreation areas in the subsection "Community Development."

Engineers and builders can find, under "Engineering Uses of Soils," tables that contain test data, estimates of soil properties, and information about soil features that affect engineering practices.

Scientists and others can read about how the soils formed and how they are classified in the section "Formation and Classification of Soils."

Newcomers in Litchfield County may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the section "General Nature of the County."

Cover: The valley of the Housatonic River. Open fields are used for dairy farming; they consist of Stockbridge soils, on the left, and Groton and Copake soils, on the right. Hilly wooded areas in background are occupied by Charlton and Hollis soils.

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SOIL SURVEY OF LITCHFIELD COUNTY, CONNECTICUT

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SOILS SURVEYED BY WALTER N. GONICK, BERKELEY R. RICHARDSON, DAVID B. THOMPSON, AND DAVID L. YOST, SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE IN COOPERATION WITH THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION AND THE STORRS AGRICULTURAL EXPERIMENT STATION

LITCHFIELD COUNTY is in the northwestern part of Connecticut; it adjoins Massachusetts on the north and New York State on the west (fig. 1). The county is made up of 26 towns and has a land area of 600,320 acres, or 938 square miles (*16*).[1] It is entirely within the New England physiographic province and occupies parts of two sections, the New England Upland section and the Taconic section with the adjoining limestone valley (*5*). Locally, the area covered by the county is called the Western Highlands of Connecticut.

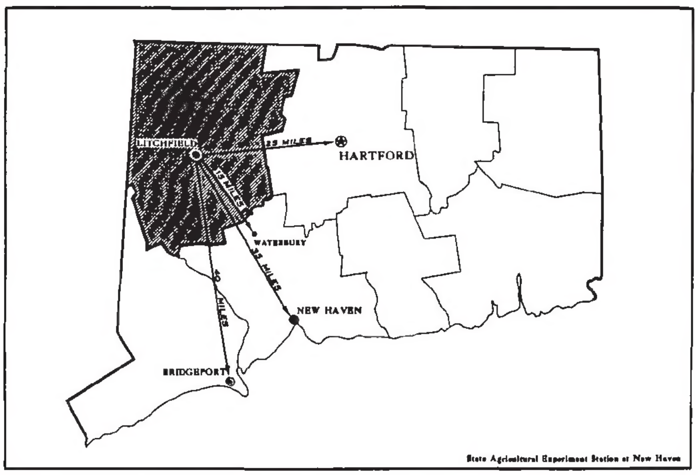

***Figure 1.*—Location of Litchfield County in Connecticut.**

In 1960, the population of the county was 119,856, and that of Torrington, the largest town, was 30,045. The town of Litchfield is the county seat.

Litchfield County is mainly agricultural. In 1964, it was the leading dairy county in the State and the most extensive crops grown were those in support of dairying. Hay and corn for silage are the principal crops. Of secondary importance are forest products, greenhouse products, poultry, and orchard fruits.

[1] Italic numbers in parentheses refer to literature cited, p. 103.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soils are in Litchfield County, where they are located, and how they can be used.

They went into the county knowing they likely would find many soils they had already seen, and perhaps some they had not. As they traveled over the county, they observed steepness, length, and shape of slopes; size and speed of streams; kinds of native plants or crops; kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by roots of plants.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. The *soil series* and the *soil phase* are the categories of soil classification most used in a local survey.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Charlton and Gloucester, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that go with their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface soil and in slope, stoniness, or some other characteristic that affects use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Charlton fine sandy loam, 3 to 8 percent slopes, is one of several phases within the Charlton series.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the bound-

aries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that greatly help in drawing boundaries accurately. The soil map in the back of this publication was prepared from the aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning management of farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil phase.

Some mapping units are made up of soils of different series, or of different phases within one series. Two such kinds of mapping units are shown on the soil map of Litchfield County: the soil complex and the undifferentiated group.

A soil complex consists of areas of two or more soils, so intricately mixed or so small in size that they cannot be shown separately on the soil map. Each area of a complex contains some of each of the two or more dominant soils, and the pattern and relative proportions are about the same in all areas. The name of a soil complex consists of the names of the dominant soils, joined by a hyphen. An example is Kendaia-Lyons very stony silt loams.

An undifferentiated group is made up of two or more soils that could be delineated individually but are shown as one unit because, for the purpose of the soil survey, there is little value in separating them. The pattern and proportion of soils are not uniform. An area shown on the map may be made up of only one of the dominant soils, or of two or more. The name of an undifferentiated group consists of the names of the dominant soils, joined by "and." An example is Leicester, Ridgebury and Whitman very stony fine sandy loams.

In most areas surveyed there are places where the soil material is so rocky, so shallow, or so severely eroded that it cannot be classified by soil series. These places are shown on the soil map and are described in the survey, but they are called land types and are given descriptive names. Riverwash and Rock land are land types in Litchfield County.

While a soil survey is in progress, samples of soils are taken, as needed, for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soils in other places are assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soils. Yields under defined management are estimated for all the soils.

But only part of a soil survey is done when the soils have been named, described, and delineated on the map, and the laboratory data and yield data have been assembled. The mass of detailed information then needs to be organized in a way that it is readily useful to different groups of readers, among them farmers, managers of woodland, engineers, and homeowners. Grouping soils that are similar in suitability for each specified use is the method of organization commonly used in the soil surveys.

On the basis of the yield and practice tables and other data, the soil scientists set up trial groups. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others, then adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under present methods of use and management.

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in Litchfield County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of farming or other land use. Such a map is not suitable for planning the management of a farm or field or choosing the site for a building or other structure, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect management.

The seven soil associations in the county are discussed in the following pages. Unless otherwise indicated, the textures given in describing the soils refer to the surface layer.

1. Hollis-Bernardston Association

Gently sloping to steep, well-drained or somewhat excessively drained, rocky soils that are shallow to bedrock and deep, well-drained soils that have a fragipan; on uplands

This association is in the northwestern corner of the county and is gently sloping to steep. The elevation ranges from about 900 to 2,300 feet above sea level and includes the highest in the State. To the east and south of the association is the limestone valley. The easterly slopes facing the valley are steep, and the southerly ones are steep to sloping. Riga Lake, at an elevation of 1,750 feet, is in the western part of the area. This association covers about 2 percent of the county.

About 45 percent of the total acreage is Hollis soils, 40 percent is Bernardston soils, and 15 percent is minor soils. Generally, the Hollis soils occupy the mountain peaks and the steeper ridges; the Bernardston soils lie on the more gentle side slopes and in the areas between the peaks. The largest areas of Bernardston soils occur in the southern part of the association, downslope from Riga Mountain.

Hollis soils are shallow to bedrock, are well drained or somewhat excessively drained, and developed in a thin mantle of glacial till generally derived from Salisbury schist. In places the bedrock crops out and stones occur on the surface.

The Bernardston soils are deep and well drained, but they have a slowly permeable layer (fragipan) at a depth of about 2 feet. Channery fragments and stones are common on these soils and in them.

Small areas of Woodbridge soils and of Peat and Muck are scattered throughout the association.

This association is largely in forest, and only about 10 percent of it has been cleared. In some places the gently sloping and sloping soils have been cleared and are used for crops in support of dairying, a good use. Generally, the association is highly suitable for recreation and includes some desirable scenic views.

2. Stockbridge-Farmington-Amenia Association

Mostly gently sloping to steep, well drained and moderately well drained, deep soils that formed in glacial till and somewhat excessively drained, rocky soils that are shallow to bedrock; on uplands in the limestone valley

This association is made up of two areas in northwestern Litchfield County. It covers parts of the towns of Salisbury, North Canaan, and Sharon and also occupies small acreages in the towns of Canaan, Cornwall, and Goshen. Most of the association is gently sloping or sloping, but some areas are very strongly sloping or steep (fig. 2). The elevation generally ranges from 600 to 900 feet, though it rises to more than 1,000 feet in isolated places, including Falls Mountain, Indian Mountain, and Wetauwanchu Mountain. The association makes up about 8 percent of the county.

About 45 percent of the total acreage is Stockbridge soils, 25 percent is Farmington soils, 15 percent is Amenia soils, and 15 percent is minor soils. The major soils, the Stockbridge, Farmington, and Amenia, all developed in limestone glacial till and a variable amount of schist. The Stockbridge soils occupy the tops and sides of drumlins. Nearby and generally downslope are the Amenia soils, which also lie in seep areas on the sides of drumlins. The Farmington soils are scattered throughout the limestone valley, where they occur on isolated ridges or are intermingled with the Amenia and Stockbridge soils.

Figure 2.—**Amenia soils are in the foreground, and Stockbridge soils occupy the cleared areas in the background. Wooded hills consist of Hollis and Charlton soils.**

The Stockbridge soils are loams that are underlain by firm or very firm glacial till at a depth of about 24 inches. Their drainage is good, but their permeability is slow or very slow in the substratum.

Farmington soils are silt loams that are shallow over limestone or interbedded limestone and schist. These soils are friable, somewhat droughty, and generally less than 20 inches thick, though deeper pockets occur in places. Some areas have stones on the surface.

The Amenia soils, like the Stockbridge, have a slowly or very slowly permeable layer at a depth of about 24 inches. But the Amenia soils are only moderately well drained and dry out slowly in spring.

Also in the association are small areas of poorly drained Kendaia soils, very poorly drained Lyons soils, and well-drained Dover soils. In addition, there are small areas of Groton soils, Copake soils, and Peat and Muck.

This association includes some of the better upland soils for farming in the county. Generally, the soils are well suited to crops grown in support of the dairy industry. About 60 percent of the acreage consists of open fields that are used mainly in dairying, but some areas around lakes are used as sites for camps, summer cottages, and year-round residences. A small acreage is in private schools and estates.

3. Hollis-Charlton Association

Gently sloping to steep, somewhat excessively drained or well-drained, rocky soils that are shallow to bedrock and deep, well-drained soils that formed in glacial till; on uplands

This extensive association occupies large areas in several parts of the county. In the north-central part it includes the Canaan Mountain; in the northeastern part it covers some of the towns of Colebrook and Barkhamsted; and in the western part it includes the hills and escarpments on both sides of the Housatonic River. It also occurs in the towns of New Milford, Bridgewater, Roxbury, and Woodbury in the southern part of the county. The association generally is moderately steep to very steep, but some areas are less strongly sloping. (See fig. 2, p. 3.) The elevation ranges from about 450 feet in Roxbury to about 1,750 feet on Canaan Mountain. The association occupies about 29 percent of the county.

The Hollis soils account for about 60 percent of the total acreage, the Charlton soils about 25 percent, and minor soils the remaining 15 percent. Hollis soils generally occur on the sides of ridges, whereas the Charlton soils, or intermingled Charlton and Hollis soils, most commonly lie on broad ridgetops and in the areas between the ridges.

Hollis soils are friable, well drained or somewhat excessively drained, and somewhat droughty. They developed in a thin mantle of glacial till and generally are less than 20 inches deep. Because the underlying bedrock has a wavy surface, however, the soils are deeper in small areas. Bedrock commonly crops out, and stones and boulders lie on the surface in most places.

Charlton soils are deep, well drained, friable, and easy to work. Their permeability is moderate or moderately rapid in the surface layer and subsoil, and it is moderately rapid in the underlying till.

Scattered throughout the association, on flats and gentle side slopes and in depressions, are small areas of Leicester, Ridgebury, and Whitman soils and of Peat and Muck. Also, there are small areas of Gloucester, Sutton, and Woodbridge soils.

Because they are rocky and steep, the soils of this association generally are not suitable for farming, though some of the acreage is used for dairying. Most of the association is in forest, a good use. Other suitable uses are wildlife habitat and recreation. Some areas are of value as scenic views and as sites for homes, camps, and summer cottages.

4. Charlton-Paxton-Hollis Association

Gently sloping to steep, well-drained, deep soils that formed in glacial till and somewhat excessively drained or well-drained, rocky soils that are shallow to bedrock; on uplands

This association is in seven areas that occur throughout Litchfield County. It is nearly level or gently sloping in the narrow valleys and is gently sloping or undulating to steep in the uplands. The elevation ranges from about 200 feet in the town of New Milford to about 1,700 feet in the town of Norfolk. It is the most extensive association in the county and occupies 42 percent of the total acreage.

About 35 percent of the association is Charlton soils, 25 percent is Paxton soils, 25 percent is Hollis soils, and 15 percent is minor soils. The Charlton soils are on uplands, and in places the Paxton soils are intermingled with them. Paxton soils also lie on smooth drumlins that are elongated in a north-south direction. In some places the Hollis soils occupy the southern end of drumlins or drumlinlike hills, and in others they form an intricate pattern with the Charlton soils.

The Charlton are deep, well-drained soils that developed in firm to friable glacial till. These soils are fine sandy loam throughout and are easy to work. Their available water capacity is moderate. Water moves through them fairly rapidly.

The Paxton soils are well-drained fine sandy loams that formed in glacial till. At a depth of about 24 inches, they contain a layer that is slowly or very slowly permeable.

The Hollis soils formed in till generally less than 20 inches thick over bedrock. Owing to the uneven surface of the underlying rock, however, the thickness of the till is variable. These soils are somewhat droughty and commonly are covered with stones and boulders in varying number. Also, bedrock crops out in places.

Among the minor soils are the Shapleigh, Gloucester, Sutton, and Woodbridge soils. The Hinckley and Merrimac soils occupy scattered areas in the narrow valleys.

About 60 percent of this association is covered with cutover forest, and 40 percent has been cleared and is used for farming. Dairying is the main farm enterprise, and there are a few orchards, but some of the cleared areas are used for houselots or are idle. The association generally is well suited to dairy farming. It also is suited to orchards because air drainage is adequate on ridges and drumlins. In places, however, small stony fields surrounded by stone walls hinder the use of modern farm machinery.

5. Paxton-Woodbridge Association

Gently sloping to steep, well drained and moderately well drained soils that formed in glacial till and have a fragipan; on uplands

This association is in two areas, one of which is in the east-central part of the county, the other in the southwestern part. Both are areas of elongated, smoothly rounded drumlins that extend roughly north and south. The association generally is gently sloping or sloping, but in places it is steep on the eastern and western sides of large drumlins. The elevation ranges from 800 feet in Bethlehem to 1,370 feet in Goshen. About 12 percent of the county is in this association.

Of the total acreage, Paxton soils make up about 60 percent, Woodbridge soils about 25 percent, and minor soils 15 percent. The Paxton soils commonly lie on the top and sides of drumlins and on low drumloidal hills. Intermingled with these soils, generally downslope from them on the lower sides of drumlins, are the Woodbridge soils.

The well-drained Paxton soils have a fine sandy loam surface layer and subsoil and a fine sandy loam to gravelly sandy loam substratum. They developed on slowly or very slowly permeable glacial till, and they contain a fragipan at a depth of about 24 inches.

The moderately well drained Woodbridge soils also have a slowly or very slowly permeable layer (fragipan) at a 24-inch depth. A seasonal high water table restricts internal drainage, and the soils dry out slowly in spring.

Other soils in the association are the Whitman, Ridgebury, Charlton, and Hollis, all of which occupy small, scattered areas.

Large areas of this association have been cleared or partly cleared of stones. Most of the acreage is used for crops in support of dairying, and the rest is in cutover forest, is used for homesites, or is idle. Except for alfalfa, crops grown for dairying are well suited. Other suitable uses are woodland, wildlife habitat, and recreation. For onsite sewage disposal systems, however, the soils have severe limitations, and the development of new communities should be adequately planned.

6. Hinckley-Merrimac-Hartland Association

Mostly nearly level to gently sloping or undulating, excessively drained to well-drained soils on terraces

This association lies in the valley of the Housatonic River in the towns of Kent and New Milford. It also occurs in the narrow valleys of some of the other major streams in the county. The association generally is nearly level or undulating to sloping, but commonly it is moderately steep or steep on the terrace breaks. The elevation ranges from about 220 to 600 feet. About 4 percent of the county is in the association.

The Hinckley soils make up about 50 percent of the total acreage, the Merrimac soils 25 percent, the Hartland soils 10 percent, and minor soils 15 percent. Hinckley soils occur on terraces and contact faces along the valley walls and on kames and eskers. Also on terraces are the Merrimac and Hartland soils.

The Hinckley soils developed in deep deposits of stratified sand and gravel. They are sandy and gravelly, excessively drained, and droughty. Their permeability is rapid or very rapid, and their available water capacity is low.

The Merrimac soils are sandy, somewhat excessively drained, and underlain by stratified sand and gravel at a depth of about 2 feet. These soils have moderate available water capacity and moderately rapid permeability. They are free of surface stones and easy to work.

Hartland soils are deep and well drained; they developed in deep silt and very fine sand. Their available water capacity is high, and their permeability is moderate.

The Enfield, Windsor, and Belgrade soils occupy small areas on terraces, and there are small areas of Ondawa and Podunk soils on flood plains.

A large percentage of this association has been cleared and is used for crops that support dairying. Some of the acreage is idle, and some is used for housing and industrial sites. In the towns of New Hartford and Barkhamsted, some of the association is in State forests. In the New Milford area, some fields are used for growing vegetable crops and nursery stock. If the soils of this association are well managed, they are suited to general farm crops and specialty crops. In some places, however, lack of sufficient moisture is damaging to crops in summer.

7. Copake-Groton-Genesee Association

Mostly nearly level to gently sloping or undulating, well-drained and excessively drained soils on terraces and nearly level, well-drained soils on flood plains in the limestone valley

This association is in the Housatonic River valley in the northwestern part of the county. The valley is about 2 miles wide in Canaan, but it gradually narrows in Cornwall and is about 3,000 feet wide in Kent. The association generally is nearly level to sloping or undulating, though some escarpments are sloping to steep. The elevation ranges from about 360 feet in Kent to 650 feet in North Canaan. The association makes up about 3 percent of the county.

About 50 percent of the total acreage is Copake soils, 25 percent is Groton soils, 10 percent is Genesee soils, and 15 percent is minor soils. The Copake soils are on terraces. Near them are the Groton soils, and these commonly are more sloping or undulating than the Copake soils. The Genesee soils lie on flood plains, where they are subject to irregular seasonal flooding.

The Copake soils are well-drained loams that developed in deposits of material derived mainly from schist and limestone. They are very friable, moderately permeable, and easy to work. Their available water capacity is moderate.

The Groton soils are excessively drained, have low available water capacity, and are droughty. They developed in sandy and gravelly materials derived from limestone and other rocks.

Genesee soils are well-drained silt loams that formed in recent deposits containing limestone. Some of the sediments recently deposited were washed from higher lying Copake and Groton soils. The Genesee soils are moderately permeable and have high available water capacity.

Scattered throughout the association are small areas of Granby, Hero, and Fredon soils on terraces and of Eel, Limerick, and Saco soils on flood plains.

About 60 percent of this association has been cleared and is used mainly for dairy farming or is idle. The rest is in forest, homesites, estates, and industrial developments. The soils are among the better ones for farming on terraces and flood plains in the county. In addition to dairying, wildlife habitat and recreation are among the suitable uses. The valley of the Housatonic River is one of the scenic attractions in the county.

Use and Management of Soils

The first part of this section discusses basic practices of management that are needed on all soils used for cultivated crops and pasture. The second part explains how soils are grouped according to their capability and describes the capability units in Litchfield County. In the third part there are estimates of average yields of principal crops grown under two levels of management. Other parts tell about the use of soils as woodland, the engineering uses of soils, community development, and the use of soils for wildlife.

Basic Practices of Management

Discussed in the following paragraphs are the basic practices needed on all the soils of the county that are suitable for tilled crops and tame pasture. The chief practices are those that maintain or improve soil fertility, control erosion, and provide supplementary drainage where necessary. They should be considered along with the management that is discussed for soils in each capability unit.

Fertility can be improved by choosing a cropping system that regularly adds organic matter to the soils. On dairy farms a diversified cropping system is followed and all barnyard manure is used. Where truck crops or other special crops are grown intensively, green-manure crops are needed and all crop residues should be returned to the soils.

Except for soils that formed in material derived from limestone, the soils of the county are low or very low in natural fertility and, in unlimed areas, are acid. The soils that formed in limestone material are slightly more fertile and range from medium acid to alkaline in their surface layer and subsoil. Lime and fertilizer should be applied in amounts indicated by soil tests. On soils that are subject to rapid leaching, it is beneficial to apply fertilizer in more than one application. Working soils that are too wet damages their structure and tends to form a tillage pan.

Some soils in the county are wet because they have a high water table, are saturated by runoff from adjacent areas, are slowly permeable in their subsoil, or are affected by a combination of these conditions. Soils such as the Fredon, Kendaia, and Leicester can be drained by tile if outlets are available. Land smoothing or open ditching is effective in some places. Diversion terraces are useful in removing excess water from nearly level to sloping soils such as the Amenia and Woodbridge.

Water erosion is a moderate to severe hazard on gently sloping to steep soils that are left unprotected. Also, soil blowing is likely in bare areas of soils that have a loamy sand or sandy loam surface layer. In places where slopes are relatively uniform, water erosion or wind damage can be controlled by contour stripcropping or diversion terraces. On soils that have irregular slopes, where contour farming and terracing are not practical, erosion can be checked by using close-growing crops. Grassed waterways are useful for disposing of excess water on all soils that are subject to erosion.

Old permanent pasture is improved if the sod is broken, if suitable grasses and legumes are seeded, and if lime and fertilizer are used in amounts indicated by soil tests. Grazing should be controlled to prevent damage by trampling during wet periods and to maintain adequate growth of forage plants.

Recommendations for crop varieties and pasture-seeding mixtures can be obtained from publications of the Connecticut Agricultural Experiment Station at New Haven, the Valley Laboratory at Windsor, and the Storrs Agricultural Experiment Station at Storrs. The staff of the Agricultural Extension Service and the Soil Conservation Service in the county can help to interpret these recommendations and can give technical assistance in planning land preparation, cropping systems, terracing, drainage, pasture management, and other farming practices. Assistance in managing woodland is available from the Service Forester, Connecticut Parks and Forest Commission, Pleasant Valley, Connecticut.

Capability Groups of Soils

Capability classification is a grouping of soils to show, in a general way, their suitability for most kinds of farming. It is a practical classification based on limitations of the soils, the risk of damage when they are used, and the way they respond to treatment. The classification does not apply to most horticultural crops, or to rice and other crops that have their own special requirements. The soils are classified according to degree and kind of permanent limitation, but without consideration of major and generally expensive landforming that would change the slope, depth, or other characteristics of the soils; and without consideration of possible but unlikely major reclamation projects.

In the capability system, all kinds of soils are grouped at three levels, the capability class, subclass, and unit. These are discussed in the following paragraphs.

Capabiity Classes, the broadest grouping, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. Classes are defined as follows:

Class I. Soils have few limitations that restrict their use.

Class II. Soils have some limitations that reduce the choice of plants or require moderate conservation practices.

Class III. Soils have severe limitations that reduce the choice of plants, require special conservation practices, or both.

Class IV. Soils have very severe limitations that restrict the choice of plants, require very careful management, or both.

Class V. Soils are subject to little or no erosion but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife food and cover.

Class VI. Soils have severe limitations that generally make them unsuitable for cultivation and limit their use largely to pasture, range, woodland, or wildlife food and cover.

Class VII. Soils have very severe limitations that make them unsuitable for cultivation and restrict their use largely to grazing, woodland, or wildlife.

Class VIII. Soils and landforms have limitations that preclude their use for commercial plant production and restrict their use to recreation, wildlife, or water supply, or to esthetic purposes.

Capability Subclasses are soil groups within one class; they are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in some parts of the United States but not in Litchfield County, shows that the chief limitation is climate that is too cold or too dry.

Capability Units are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about the management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-1 or IIIs-2. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitation, and the small letter indicates the subclass, or kind of limitation as defined in the foregoing paragraph. The Arabic numeral specifically identifies the capability unit within each subclass.

Management by capability units

In the following pages, the capability units in Litchfield County are described and suggestions for the use and management of the soils are given. The names of the soil series represented are mentioned in the description of each capability unit, but this does not mean that all

the soils of a given series appear in the unit. To find the names of all the soils in any given capability unit, refer to the "Guide to Mapping Units" at the back of this survey.

CAPABILITY UNIT I–1

This unit consists of nearly level, well-drained, medium-textured and moderately coarse textured soils on uplands and terraces. These soils are of the Charlton, Copake, Dover, Enfield, and Hartland series. They are very friable, moderately to rapidly permeable, and moderate to high in available moisture capacity. The soils have good internal drainage and dry out fairly rapidly in spring and after rain. Except for the Dover and Copake, the soils generally are strongly acid unless they have been limed, but all of them respond well to fertilization and other management practices.

The Charlton and Dover soils developed on friable to firm glacial till, and the other soils developed on stratified sand and gravel or in deep silt and very fine sand. All are free or nearly free of surface stones and boulders. The Charlton and Dover soils contain small rock fragments, cobblestones, and stones that may interfere somewhat with cultivation.

The soils in this unit are well suited to cultivated crops grown in the county. The principal crops are silage corn and plants grown for hay, silage, and pasture. Small acreages are used for sweet corn, potatoes, other vegetable crops, and small grains. Orchards also are suitable, especially on the Charlton soil, which lies at higher elevations and has better air drainage than the other soils. Tobacco can be grown on the Hartland soil in New Milford.

The soils of this unit can be used intensively with a minimum risk of erosion, but they need to be carefully managed so that good tilth is maintained.

CAPABILITY UNIT I–2

This unit consists of nearly level, well-drained, medium-textured and moderately coarse textured soils of the Paxton and Stockbridge series on uplands. These soils have a slowly or very slowly permeable layer at a depth of about 2 feet. Above this layer the soil material is friable, moderately permeable, and high in available moisture capacity. The Paxton soil is strongly acid; the Stockbridge soil is neutral to calcareous in the substratum.

These soils have restricted internal drainage because of the slowly or very slowly permeable layer, and they dry out and warm up rather slowly in spring. Crops seldom are damaged from too little moisture during the growing season, but if management is poor, frost heaving of alfalfa plants is common in winter and early in spring. Although both soils are free or nearly free of surface stones and boulders, small angular rock fragments and cobblestones interfere somewhat with cultivation. The Stockbridge soil contains limestone fragments and leached limestone in its subsoil.

The soils of this unit generally are well suited to crops grown in the county. They are used principally for silage corn, other plants grown for silage, and plants grown for hay or pasture. A small acreage is in orchards.

Erosion is only a slight hazard on these soils, but management is needed that promotes good tilth and supplies organic matter regularly.

CAPABILITY UNIT IIe–1

In this unit are gently sloping or undulating, well-drained, medium-textured and moderately coarse textured soils on uplands and terraces. These soils are of the Branford, Charlton, Copake, Dover, Enfield, and Hartland series. They are moderately susceptible to erosion if they are not protected. The soils are very friable, are moderately to rapidly permeable, and have moderate to high available moisture capacity. Good internal drainage permits cultivation soon after rain and early in spring. Except for the Copake and Dover, the soils are strongly acid, but they respond to good management. One of the Charlton soils is eroded, and it is shallower and somewhat more droughty than the other soils in the unit.

Some of the soils developed on sand and gravel, others on friable to firm glacial till, and the Hartland soil in deep silt and very fine sandy loam. All the soils are generally free of surface stones and boulders, but some have small angular rock fragments and cobblestones on the surface and contain large stones below the surface.

The soils in this unit generally are well suited to crops grown in the county. These crops include silage corn, grass, hay, alfalfa, pasture, orchards, some kinds of small grain, and sweet corn. The soils can be cultivated fairly intensively if they are well managed. Among the practices needed for controlling erosion is contour cultivation, as well as terraces and waterways in fields where slopes are long. Also needed are regular additions of organic matter and practices that maintain good tilth.

CAPABILITY UNIT IIe–2

This unit is made up of gently sloping or undulating, well-drained, medium-textured and moderately coarse textured soils that have a slowly or very slowly permeable layer at a depth of about 2 feet. These soils occupy uplands and are of the Bernardston, Paxton, and Stockbridge series. They are friable or very friable and moderately permeable, and they have high available moisture capacity. The slowly or very slowly permeable layer causes waterlogging in winter and spring. Consequently, the soils warm up rather slowly in spring. During the growing season, they usually hold enough moisture available to plants. Except for the Stockbridge, the soils in the unit are strongly acid unless they have been limed. Two of the soils are eroded, and these are somewhat shallower and more droughty than the other soils.

The soils of this unit generally are free of surface stones and boulders. In places, however, cobblestones and small angular fragments on the surface and below it may interfere somewhat with cultivation.

These soils are used mainly in support for dairying. To a limited extent, they also are used for orchards. The principal crops are millet, sudangrass, silage corn, grasses for hay and pasture, and legumes such as alfalfa and birdsfoot trefoil (fig. 3). Alfalfa grows well for a few years, but it may be damaged by frost heave unless it is well managed.

Erosion is a greater hazard on these soils than on the soils in unit IIe–1. Where cultivation is intensive, soil losses should be controlled by contour cultivation, in places by cropland terraces, and on long slopes by waterways. Spot drainage is desirable in some seep areas.

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Figure 3.—**In the foreground, haying on Stockbridge loam, 3 to 8 percent slopes, a soil in capability unit IIe–2. In the background, stripcropping on Stockbridge loam, 8 to 15 percent slopes, capability unit IIIe–2.**

CAPABILITY UNIT IIw–1

In this unit are nearly level, moderately well drained, medium-textured and moderately coarse textured soils of the Belgrade, Hero, Sudbury, Sutton, and Tisbury series. These soils occur on uplands and terraces. They are very friable, have moderate to moderately rapid permeability, and are moderate to high in available moisture capacity.

Most of these soils developed on stratified sand and gravel, but the Sutton soil developed on very friable to firm glacial till and the Belgrade soil in deep silt and very fine sand. Mottles within 15 to 20 inches of the surface indicate that internal drainage is restricted and the water table is seasonally high, mainly in winter. In unlimed areas all the soils except the Hero are strongly acid to medium acid.

Undrained, the soils in this unit generally are suited to silage corn and to grasses and legumes grown for hay or pasture. Millet and sudangrass grow well, and so do red clover, birdsfoot trefoil, and Ladino clover, but alfalfa is subject to frost heave and eventually is replaced by grass. Partly drained areas are suited to general crops.

Although these soils warm up slowly in spring, they respond to management and can produce well, especially in years that are somewhat dry. Management is needed that favors good tilth and provides a good supply of organic matter. Pastures should be grazed in rotation.

CAPABILITY UNIT IIw–2

This unit consists of nearly level, moderately well drained, medium-textured and moderately coarse textured soils of the uplands that have a slowly or very slowly permeable layer at a depth of 20 to 26 inches. These soils are of the Amenia and Woodbridge series. They are friable or very friable, and they have moderate to high available moisture capacity. Because internal drainage is restricted by the slowly or very slowly permeable layer, the water table is seasonably high in winter and early in spring. Also, mottles indicate that after heavy rainfall in summer, a water table sometimes is perched within 10 to 20 inches of the surface.

These soils generally are free of surface stones, and if drained they are suited to general farm crops. Undrained areas are used extensively for hay and pasture in support of dairying, and they are well suited to silage corn in years that are somewhat dry. Millet and sudangrass grow well, but alfalfa tends to run out after a few years because it is damaged by frost heaving. If the Amenia soil is drained, however, it is well suited to alfalfa.

In areas used for row crops or orchards, these soils need to be drained and, in many places, protected by diversion terraces that intercept runoff and seepage water from higher areas. Grazing of pastures should be controlled.

CAPABILITY UNIT IIw–4

In this unit are well-drained, medium-textured and moderately coarse textured soils of the Genesee and Ondawa series on flood plains. These soils are moderately to rapidly permeable and have moderate to high available moisture capacity. Flooding is the greatest hazard to use, but it seldom occurs during the growing season. The soils are stone free and easy to work.

These soils are well suited to general crops, but because they are subject to flooding late in fall and early in spring, they are used mainly for hay, pasture, and silage corn. Grasses, grass-legume mixtures, sudangrass, and millet grow well under good management. Streambank protection is needed in places.

CAPABILITY UNIT IIw–5

This unit consists of moderately well drained, medium-textured and moderately coarse textured, nearly level soils of the Eel and Podunk series. These soils lie on flood plains along streams, where they are subject to occasional or frequent flooding. Their permeability is moderate or moderately rapid, but in wet periods a fluctuating water table rises within 15 to 20 inches of the surface and restricts drainage. The soils have moderate to high available moisture capacity, and they are stone free and easy to work.

These soils are used mainly for hay and pasture, but a small acreage is used for silage corn, sudangrass, and millet. Controlled grazing and other suitable measures are needed to keep the soils in good tilth and to provide a regular supply of organic matter. Grazing is not advisable when the soils are wet.

CAPABILITY UNIT IIwe–1

This unit consists of moderately well drained, gently sloping or undulating, medium-textured and moderately coarse textured soils on uplands and terraces. These soils are of the Belgrade, Hero, Sudbury, Sutton, and Tisbury series. Their available moisture capacity is moderate to high. Permeability is moderate or moderately rapid, but internal drainage is restricted by a seasonally high water table. As indicated by mottling, the water table rises to within 15 to 20 inches of the surface.

The Hero, Sudbury, and Tisbury soils developed on stratified sand and gravel, the Belgrade soil in deep silt and very fine sand, and the Sutton soil on very friable to firm glacial till. All the soils generally are free of surface stones, but the Sutton soil contains small angular

rock fragments and cobblestones that may interfere somewhat with cultivation.

In cleared areas the soils of this unit are used mainly for silage corn, hay, and pasture in support of dairying. Improved drainage is not needed for these uses. Surface runoff is medium but can be controlled by contour cultivation and, where needed, by field terraces and sodded waterways. For orchards and some kinds of row crops, it may be necessary to provide adequate drainage.

Management is needed that preserves good tilth and supplies organic matter regularly. A plowsole tends to form if the soils are plowed when wet. Pastures should be grazed in rotation.

CAPABILITY UNIT IIwe-2

In this unit are moderately well drained, gently sloping, medium-textured and moderately coarse textured soils that have a firm or very firm layer, or pan, at a depth of 20 to 26 inches. These soils occur on uplands and are of the Amenia and Woodbridge series. The pan is slowly or very slowly permeable and restricts internal drainage during wet periods. Mottles indicate that the water table is seasonally within 15 to 20 inches of the surface. Above the pan the soils are friable or very friable, moderately permeable, and moderate to high in available moisture capacity. The Woodbridge soil is medium acid; the Amenia soil is neutral to alkaline in the subsurface layers.

The Amenia soil occurs mostly in the western limestone area of the county, whereas the Woodridge soil is widely distributed. Both soils are used chiefly for crops in support of dairying. Undrained areas are well suited to hay and pasture and are fairly well suited to silage corn. Ladino clover, red clover, birdsfoot trefoil, and other moisture-tolerant legumes grow well. Where the soils are adequately drained, they can be used for alfalfa and general crops. Because the Amenia soil contains an adequate supply of lime in its lower horizons, it is especially well suited to alfalfa if drainage is good.

Erosion is a moderate hazard in fields that are clean cultivated. Measures for controlling erosion should include diversion terraces, graded stripcropping or contour cultivation, and sodded waterways.

CAPABILITY UNIT IIs-1

This unit consists of a well-drained or somewhat excessively drained Merrimac soil and a moderately well drained, coarse-textured Deerfield soil. Both soils are nearly level and somewhat droughty. They warm up early in spring and are easily worked. Their permeability is moderately rapid, and their available moisture capacity is moderate to low.

These soils are suited to many kinds of crops if fertilizer is regularly applied and if the moisture supply is adequate. Alfalfa grows well, but general crops do poorly in dry periods unless they are irrigated. Surface runoff is medium, and in unprotected fields water erosion and soil blowing are hazards late in winter and in spring.

CAPABILITY UNIT IIs-2

This unit is made up of somewhat excessively drained, gently sloping or undulating soils that are somewhat droughty. These soils occupy uplands and terraces and are of the Gloucester and Merrimac series. They are very friable, are moderately rapid in permeability, and have moderate to low available moisture capacity. The soils respond to good management, including fertilization.

These soils are used mainly for alfalfa, corn, other general crops, sweet corn, and other vegetable crops. Irrigation is needed to provide enough water in dry periods. Simple practices are adequate for reducing runoff and controlling erosion.

CAPABILITY UNIT IIIe-1

This unit consists of sloping or rolling, well-drained, medium-textured and moderately coarse textured soils on uplands and terraces. These soils are of the Branford, Charlton, Copake, Dover, Enfield, and Hartland series. The soils are highly susceptible to erosion if they are cultivated and not protected. They are very friable or friable, are moderately to rapidly permeable, and have moderate to high available moisture capacity. Because internal drainage is good, these soils warm up early in spring and dry out soon after heavy rain. Except for the Copake and Dover, the soils generally are strongly acid unless they have been limed. One of the Charlton soils is eroded, and it is shallower and somewhat more droughty than the other Charlton soil.

Some of the soils in this unit developed on very friable to firm glacial till, others on stratified sand and gravel, and the Hartland soil in deep silt and very fine sand. All respond well to good management.

These soils are suited to crops commonly grown in the county. Cleared areas are used mainly for silage corn and for hay and pasture plants in support of dairying. Alfalfa grows well on these soils, and so do small grains, orchard fruits, and sweet corn. In fields where cultivation is intensive, management is needed that improves or maintains fertility, supplies organic matter, and controls erosion. Such management includes contour stripcropping, sodded waterways, and where practical, diversion terraces spaced at intervals of 300 feet or less.

CAPABILITY UNIT IIIe-2

This unit is made up of sloping, well-drained, medium-textured and moderately coarse textured soils that have a firm, slowly or very slowly permeable layer at a depth of about 24 inches. These soils occupy uplands and are of the Bernardston, Paxton, and Stockbridge series. Above the firm layer the soils are moderately permeable and have high available moisture capacity, but this layer causes waterlogging in wet periods and after heavy rainfall. During the growing season, enough moisture is usually available for plants. Except for the Stockbridge, the soils are strongly acid in the substratum. Two of the soils are eroded, and they are shallower and somewhat more droughty than the other soils.

The soils in this unit are suited to hay plants, corn for silage, and pasture, and large areas are used for these crops. They also are suited to fruit trees, corn for grain, and small grains. Alfalfa grows well under good management, but it is subject to frost heave and commonly is seeded in a hay mixture with other plants.

The risk of erosion limits the use of these soils for cultivated crops. Erosion control, good tilth, and a regu-

lar supply of organic matter are required if the soils are used and kept productive. Soil losses can be checked by stripcropping on the contour, using sodded waterways, and constructing diversion terraces at intervals of about 300 feet.

CAPABILITY UNIT IIIe-3

This unit consists of sloping, well-drained to somewhat excessively drained soils of the Gloucester and Merrimac series on uplands. These soils have moderately rapid permeability and moderate to low available moisture capacity. They are easily worked and warm up rapidly in spring. Because of slope, the risk of erosion is fairly great.

In many places these soils have been cleared and are used in dairying. Silage corn, alfalfa, and other plants grown for hay, silage, or pasture are the common crops. Shallow-rooted crops are poorly suited because a limited amount of moisture is available in summer and early in fall. In managing the soils the main concerns are controlling erosion, supplying organic matter, maintaining good tilth, and conserving moisture. Contour stripcropping, diversion terraces, and sodded waterways are among the practices that help to check erosion.

CAPABILITY UNIT IIIw-1

This unit consists of somewhat poorly drained to poorly drained, medium-textured to coarse-textured, nearly level soils on uplands and terraces. These soils are of the Au Gres, Fredon, Kendaia, Leicester, Raynham, Ridgebury, and Walpole series and the Wareham series, nonacid variant. Some of the soils developed on glacial till, some on stratified sand and gravel, and others in deep silt and very fine sand. Runoff is slow to very slow, and some areas are ponded in winter. Permeability is moderate to rapid, but internal drainage is restricted by a seasonal high water table. The Kendaia and Ridgebury soils have a firm to very firm layer at a depth of 18 to 24 inches.

Soils in this unit are mainly forested, but some of their acreage is cleared. Many cleared areas are used for unimproved pasture or are idle. Areas that have been drained or partly drained are used chiefly for hay and pasture. Reed canarygrass is among the moisture-tolerant plants that are suited to hay or pasture, but birdsfoot trefoil is poorly suited. Small areas of these soils that occur in fields of better drained soils are used for silage corn.

If outlets are available, the soils of this unit can be drained by open ditches or tile lines. Because of their firm or very firm layer, however, the Ridgebury and Kendaia soils are somewhat more difficult to drain than the other soils. Land smoothing improves drainage in low, wet spots.

Pastures should be grazed in rotation and not used when the soils are too wet.

CAPABILITY UNIT IIIw-2

In this unit are Alluvial land and nearly level or level, moderately coarse textured or medium-textured, poorly drained soils of the Limerick and Rumney series. Alluvial land varies in texture and drainage. All the soils are subject to occasional flooding during the growing season and to frequent flooding in winter and early in spring. Internal drainage is restricted by a high water table. Permeability is moderate to rapid, and the available moisture capacity is moderate to high.

These soils are cleared in most places and used for hay or pasture. Undrained, they are not well suited to cultivated crops, but they are used for silage corn in small, scattered areas that occur in fields of better drained soils. Reed canarygrass and other water-tolerant plants grow well. If suitable outlets are available, the soils of this unit can be drained by using open ditches. Moisture-tolerant legumes and grasses are suitable in partly drained fields, and cultivated crops produce well in adequately drained areas. Grazing should be controlled in pastures.

CAPABILITY UNIT IIIs-1

The soils in this unit are nearly level, coarse textured, excessively drained, droughty, and low in natural fertility. They are easy to work, however, and warm up rapidly in spring. These soils occur on terraces and flood plains and are of the Hinckley, Suncook, and Windsor series. Their permeability is moderately rapid to very rapid, and their available moisture capacity is low.

These droughty, infertile soils are of limited use for general farm crops, hay, and pasture. Much of the cleared acreage is pastured or idle. Although alfalfa grows fairly well, such crops as silage corn, grasses, and other legumes cannot obtain enough moisture in summer unless irrigation water is applied. The soils respond to good management, including fertilization, but irrigation is advisable where practical. Organic matter can be supplied by returning manure and crop residues to the soils. During winter and early in spring, soil blowing is a hazard in unprotected fields.

CAPABILITY UNIT IIIs-2

This unit consists of excessively drained, droughty, nearly level Groton and Hinckley soils on terraces. These soils are moderately coarse textured in the surface layer but are coarse textured below it. They warm up rapidly in spring and respond to fertilization if moisture is adequate. Their permeability is moderately rapid to very rapid; their available moisture capacity is low. Although coarse sand and gravel occur near the surface, the soils are not so droughty as those in unit IIIs-1.

In cleared areas the soils of unit IIIs-2 are used chiefly for hay and pasture or are idle. A small acreage is used for alfalfa and silage corn. Among the plants that do fairly well are alfalfa and birdsfoot trefoil. All crops grow better if they are irrigated.

Applying manure and using crop residues keep the soils supplied with organic matter. Unless a protective cover is maintained, soil blowing is a hazard late in winter and in spring.

CAPABILITY UNIT IIIse-1

This unit is made up of excessively drained, gently sloping to rolling, shallow and gravelly soils of the Groton and Hinckley series. These soils have moderately rapid to very rapid permeability and moderately low or low available moisture capacity. They are somewhat droughty but can be worked early in spring, and they respond to fertilization if their moisture content is adequate.

These soils are mainly in cutover forest or native pasture or are idle. A small acreage is used for silage corn, alfalfa, and hay. All of these crops are fairly well suited, but they generally lack sufficient water in dry periods. Alfalfa, once established, grows well because its taproot penetrates into the substratum.

Erosion is a moderate to severe hazard in cultivated fields. Commonly, however, stripcropping and contour cultivation are impractical because the terrain is too irregular.

CAPABILITY UNIT IIIew-2

This unit consists of sloping, moderately well drained, medium-textured and moderately coarse textured soils that have a firm to very firm layer, or pan, at a depth of 20 to 24 inches. These soils are of the Amenia and Woodbridge series. Mottles beginning at a depth of about 18 inches indicate that the firm layer restricts internal drainage in wet periods. Above the pan the soils are friable to very friable, are moderately permeable, and have moderate to high available moisture capacity. They are slow to warm up in spring.

These soils are used mainly for hay and pasture but, to some extent, for silage corn and small grains. Except in seep spots, improved drainage is not needed. Moisture-tolerant grasses and legumes grow well, though alfalfa is subject to frost heave.

Erosion is a hazard in fields that are clean cultivated, and the control of runoff requires graded stripcropping, grassed waterways, and diversion terraces spaced about 200 feet apart.

CAPABILITY UNIT IVe-1

This unit consists of strongly sloping or hilly, well-drained, moderately coarse textured soils on uplands. These soils, of the Charlton, Dover, and Gloucester series, are subject to very severe erosion if they are cultivated and not protected. Their permeability is moderate to rapid, and their available moisture capacity is moderate to low.

Cleared areas are used for hay and pasture and to some extent for orchards, all of which are suitable crops. Alfalfa, birdsfoot trefoil, grasses, and grass-legume mixtures grow well.

Erosion can be controlled by stripcropping on the contour, sodding the waterways, and using diversion terraces spaced at intervals of about 300 feet. Fields used for hay and pasture should be reseeded in strips 100 feet wide across the slope.

CAPABILITY UNIT IVe-2

In this unit are strongly sloping or hilly, well-drained, moderately coarse textured and medium-textured soils that have a firm to very firm, slowly permeable layer at a depth of about 24 inches. These soils are of the Paxton and Stockbridge series. They are highly erodible if they are cultivated and not protected. Above the firm layer, permeability is moderate and the available moisture capacity is high. The eroded Paxton soil has a thinner surface layer and subsoil than the other soils.

Where the soils of this unit have been cleared, they are used mainly for hay and pasture or are idle. They are well suited to grasses and legumes for hay or pasture and to orchard trees. Because of slope and the erosion hazard, the soils can be safely cultivated only occasionally. They are more susceptible to erosion than the soils in unit IVe-1. Practices that reduce runoff and control soil losses include contour stripcropping, the use of waterways, and the construction of diversion terraces at intervals of 300 feet or less.

CAPABILITY UNIT IVes-1

The soils in this unit are gently sloping to rolling, stony, moderately coarse textured, moderately to rapidly permeable, and well drained. They are of the Charlton, Dover, and Gloucester series. These soils developed on very friable to firm glacial till. Except for the Gloucester, which is somewhat droughty, the soils have moderate available moisture capacity.

A large part of the acreage is in cutover forest. Cleared areas are used mainly for hay and pasture, but small scattered areas are used for cultivated crops and tree fruits.

Stones limit the use of modern machinery needed to produce row crops on these soils. Hay, improved pasture, orchards, and small grains are suitable crops.

CAPABILITY UNIT IVes-2

This unit consists of gently sloping to rolling, stony, medium-textured and moderately coarse textured soils on uplands. These well-drained soils are of the Bernardston, Paxton, and Stockbridge series. They developed on firm or very firm glacial till and have a slowly or very slowly permeable layer, or pan, at a depth of about 24 inches. Above the pan the soils are moderately permeable and have high available moisture capacity. All except the Stockbridge are strongly acid.

A large acreage of the soils in this unit is in cutover forest. Cleared areas are used mainly for pasture and hay but to a limited extent for orchards and row crops.

Stones limit the use of modern machinery needed to produce cultivated crops on these soils. Suitable crops include hay, orchards, improved pasture, and small grains.

CAPABILITY UNIT IVse-1

This unit consists of gently sloping to rolling, shallow, gravelly soils that are excessively drained and extremely droughty. These soils are of the Hinckley and Windsor series and lie on terraces, where they developed over sand or sand and gravel.

These soils are mostly in cutover forest or brush or are idle. Some areas are used for alfalfa and for hay and pasture. Because the soils are so droughty and low in fertility, they are not suited to cultivated crops unless irrigated and well fertilized. They are suited to alfalfa and early vegetable crops.

Soil blowing and water erosion are hazards in cultivated areas. If possible, fields should be cultivated on the contour and protected by stripcropping, waterways, and diversion terraces. In most places, however, these measures are difficult to apply because the terrain is too irregular.

CAPABILITY UNIT IVws-1

This unit consists of moderately well drained, moderately coarse textured, stony soils of the Sutton series. These nearly level and gently sloping soils occupy uplands,

where they developed on very friable to firm glacial till. Their available moisture capacity is moderate. Permeability is moderate in the surface layer and subsoil and is moderately rapid in the substratum, but drainage is restricted by a seasonal high water table.

A large part of the acreage is in cutover forest. Cleared areas are used mainly for crops in support of dairy farming or are idle. Hay and pasture are the principal crops, but orchard fruits and cultivated crops are grown in a few small areas.

Stones limit the use of modern machinery in cultivating row crops. Generally, however, the soils can be worked for hay, improved pasture, small grains, and orchards. Areas used for orchards or alfalfa require improved drainage, but grasses and moisture-tolerant legumes grow well in undrained fields.

CAPABILITY UNIT IVws-2

This unit is made up of moderately well drained, stony, nearly level to sloping soils of the Amenia and Woodbridge series on uplands. These soils developed on firm or very firm glacial till and have a compact layer, or pan, at a depth of about 2 feet. This layer, which is slowly or very slowly permeable, restricts internal drainage during wet periods. In winter and spring the water table commonly rises to within 15 to 20 inches of the surface. The available moisture capacity is moderate to high, and the layers above the pan are friable and moderately permeable. Amenia soils are neutral to alkaline in their lower horizons, whereas the Woodbridge soils are medium acid.

A large part of the acreage of these soils is forested. Although scattered areas are in cultivated crops, cleared areas are used mainly for pasture and hay.

Stones on the surface limit use of modern machinery in cultivating row crops, but in most places the soils can be worked for hay, improved pasture, and small grains. Grasses and water-tolerant legumes grow well in undrained areas, though diversion terraces are needed for intercepting seepage in some places.

CAPABILITY UNIT Vw-1

This unit consists of very poorly drained, nearly level soils on uplands and terraces. They are of the Birdsall, Granby, Lyons, and Scarboro series. Texture and permeability are variable. In these soils the ground water is at or near the surface from late in fall until late in spring, but in places it falls to a depth of 3 feet or more in summer. All the soils have a dark-colored surface layer that is high in organic-matter content. The Scarboro soil is strongly acid, but the others are medium acid to neutral in the subsoil.

Very poor drainage limits the use of these soils for farming. Cleared areas are mainly in unimproved pasture or are idle. If management is good, partly drained areas are suited to plants grown for improved pasture. Where suitable outlets are available, the soils can be drained for crops such as corn, late vegetables, grasses, and moisture-tolerant legumes.

CAPABILITY UNIT Vws-1

The only soil in this unit is Whitman stony fine sandy loam. This soil is very poorly drained. It lies on uplands, where surface runoff is slow, very slow, or ponded. A seasonal high water table restricts internal drainage in winter and spring.

Wetness and stoniness severely limit the use of this soil for farming. A large part of the acreage is forested, but small areas have been cleared and are used for unimproved pasture or are idle. Pasture plants furnish some grazing in dry periods. Among the other suitable uses are woodland and wildlife food and shelter.

CAPABILITY UNIT Vws-2

In this unit are somewhat poorly drained or poorly drained, nearly level or gently sloping, stony Leicester and Ridgebury soils that occur on uplands. The Leicester soil is underlain by very friable to firm material, but the Ridgebury soil has a compact pan layer at a depth of 18 to 24 inches. Although permeability is moderate in the surface layer and subsoil, drainage is restricted by a water table that is at or near the surface from January through March.

These soils are chiefly in forest, but some of the acreage has been cleared and is used for unimproved pasture or is idle. Because of excess water and stones, the soils are suited mainly to pasture plants, trees, and food and cover for wildlife.

CAPABILITY UNIT Vs-1

This unit consists of very stony, nearly level, well drained or moderately well drained soils on uplands. These soils developed on friable to very firm glacial till. They are of the Paxton, Sutton, and Woodbridge series. Their permeability is moderate or moderately rapid in the surface layer and subsoil, but a seasonal high water table restricts internal drainage in the Paxton and Woodbridge soils.

The soils of this unit are mainly in cutover forest. Stoniness limits their use for farming, though some areas have been cleared and are in unimproved pasture or are idle. Pasture has low carrying capacity but can be improved by topdressing to encourage native grasses and legumes and by using other practices of good management. Properly managing woodland improves the stands of desirable trees.

CAPABILITY UNIT VIe-1

The only soil in this unit is Charlton fine sandy loam, 25 to 35 percent slopes. This well-drained soil occupies uplands, where it developed on very friable to firm glacial till. It is moderately permeable in the surface layer and subsoil, and it has moderate available moisture capacity. The risk of erosion is very great if the soil is cropped and not protected.

Slope and the erosion hazard limit the use of this inextensive soil for farming. Most of the acreage is forested, but small scattered areas are in unimproved or brushy pasture. Suitable uses include permanent pasture, woodland, and wildlife food and cover. Slopes are too steep for the efficient use of machinery.

CAPABILITY UNIT VIe-2

Paxton fine sandy loam, 25 to 35 percent slopes, is the only soil in this unit. It is a well-drained, strongly acid soil that developed on compact glacial till. At a depth of about 24 inches, this soil has a compact layer, or pan. Permeability is moderate above the pan but is slow or

very slow within it, and the movement of water through the soil is restricted. The available moisture-capacity is high.

This soil is mainly in forest, but small scattered areas are in unimproved pasture or are idle. Use of the soil for farming is limited by slope and the risk of erosion. Unprotected areas are subject to serious washing. For this reason, permanent pasture is a suitable use.

CAPABILITY UNIT VIe-3

This unit consists only of steep Terrace escarpments, which include contact faces and highly dissected terraces. The material in these areas is moderately coarse textured or coarse textured and is rapidly permeable. Runoff is medium to rapid, and some areas are moderately or severely eroded.

Because this land is steep and droughty, its use for farming is limited. Although some areas have been cleared and are used for unimproved pasture or are idle, a large part of the acreage is wooded. The land is not suitable for cultivation, but it can be used for trees, pasture, and plants grown for wildlife food and shelter.

CAPABILITY UNIT VIes-1

This unit consists of strongly sloping or hilly, stony, moderately coarse textured soils of the Charlton and Gloucester series on uplands. These soils developed over friable to firm glacial till. They are well drained and have moderate or moderately low available moisture capacity.

Because of slope and stoniness, these soils are not suitable for cultivation. Most of their acreage is in cutover forest, but small scattered areas have been cleared and are pastured or idle. Permanent pasture, forest, and wildlife habitat are suitable uses, and some areas can be used for improved pasture or orchards. Commercially desirable trees can be encouraged by managing woodland properly.

CAPABILITY UNIT VIes-2

In this unit are strongly sloping or hilly, moderately coarse textured and medium-textured, stony soils on uplands. These soils, of the Paxton and Stockbridge series, have a compact, slowly permeable layer at a depth of about 24 inches. Above the compact layer, permeability is moderate and the available moisture capacity is high.

The soils in this unit are chiefly in forest, though small scattered areas have been cleared and are used for unimproved pasture or are idle. Forest, unimproved pasture, and plantings for wildlife are among the suitable uses. Some areas can be used for orchards or improved pasture.

CAPABILITY UNIT VIw-1

This unit consists of Muck, shallow, and a very poorly drained Saco soil that developed in recent alluvium on flood plains. The muck ranges from 12 to 36 inches in thickness.

Frequent flooding and very poor drainage restrict use of these soils to forest, wildlife habitat, and unimproved pasture. Normally, grazing is limited to drier periods of the year. Muck, shallow, can be drained and used for improved pasture if suitable outlets are available, but draining the Saco soil generally is impractical because flooding is such a hazard and suitable outlets are lacking.

CAPABILITY UNIT VIs-1

This unit is made up of very stony, moderately coarse textured, gently sloping or sloping soils that developed on friable to firm glacial till. These soils are well drained or moderately well drained and are of the Charlton, Gloucester, and Sutton series. Permeability is moderate or moderately rapid. Except for the Gloucester, which is somewhat droughty, the soils have moderate available moisture capacity.

Because their surface layer is so stony, the soils in this unit are of limited use for farming. Their acreage is largely in forest, but some of it is idle and some is in unimproved pasture having low carrying capacity. In addition to pasture and trees, the soils are suited to plants grown for wildlife food and shelter. Managing woodland properly encourages the growth of desirable trees.

CAPABILITY UNIT VIs-2

This unit consists of very stony, gently sloping or sloping, well drained or moderately well drained soils on uplands. These soils are of the Amenia, Bernardston, Paxton, Stockbridge, and Woodbridge series. At a depth of about 24 inches, they have a firm or very firm layer that restricts internal drainage. Above this layer, permeability is moderate and the available moisture capacity is high.

The soils in this unit are suitable for woodland, pasture (fig. 4), and wildlife. Most of the acreage is wooded, but some is in unimproved pasture and some is idle. In places pasture can be improved through good management.

CAPABILITY UNIT VIs-3

This unit consists of rocky or very rocky, medium-textured or moderately coarse textured, gently sloping or sloping soils on uplands. These soils are shallow to

Figure 4.—Pasture on Paxton very stony fine sandy loam, 3 to 15 percent slopes. This soil is in capability unit VIs-2.

bedrock and are somewhat excessively drained. They are of the Farmington, Hollis, Holyoke, and Shapleigh series. The soils developed in a thin mantle of glacial till and the underlying material derived from bedrock. Outcrops of rock range from a few to about 20 per acre, and loose stones and boulders are common on the surface. Generally, the depth to bedrock is less than 20 inches. Permeability is moderate or moderately rapid.

These soils are of limited use for farming because they are so rocky and droughty. They are mainly in forest or unimproved pasture, but small areas are used for hay and improved pasture. Most areas are difficult to work because of outcrops and stones. Suitable uses include woodland, pasture, and wildlife habitat.

CAPABILITY UNIT VIIw-1

This unit is made up only of Peat and Muck, a land type consisting of organic material that ranges from 3 to more than 25 feet in thickness. The water table is at or near the surface most of the year.

Because this land is very poorly drained, its use is limited mainly to woodland, wildlife, and pasture. A large part of the acreage is in trees or brush, and only a small part is cleared and used in farming. If suitable outlets are available, the land can be drained and used for hay or improved pasture.

CAPABILITY UNIT VIIs-1

This unit consists of very stony, strongly sloping or hilly, well-drained or somewhat excessively drained Charlton and Gloucester soils on uplands. These soils are moderately to rapidly permeable and have moderate or moderately low available moisture capacity.

Using these soils for farming is severely limited by slope and the very stony surface layer. Cutover forest is the principal use, but scattered areas have been cleared and are used for unimproved pasture or are idle. The soils are suitable as woodland or for wildlife habitat.

CAPABILITY UNIT VIIs-2

This unit is made up of very stony, strongly sloping or hilly, medium-textured and moderately coarse textured soils on uplands that have a compact layer, or pan, at a depth of about 24 inches. These well-drained soils are of the Bernardston, Paxton, and Stockbridge series. They formed in compact glacial till. Above the pan, permeability is moderate and the available moisture capacity is high.

These soils are of limited use for farming because they are so stony. They are mainly in cutover forest, but scattered areas have been cleared and are in unimproved pasture or are idle. The soils should be managed chiefly for woodland and wildlife.

CAPABILITY UNIT VIIs-3

This unit consists of gently sloping to steep, very rocky or extremely rocky soils that generally are less than 20 inches deep to bedrock. These soils occur on uplands and are of the Farmington, Hollis, Holyoke, and Shapleigh series. Outcrops of bedrock occupy as much as 50 percent of the surface of the extremely rocky soils. In some places there are loose stones and boulders on the surface.

The use of these soils for farming is limited by rockiness and slope. Cutover forest occupies the largest acreage, but scattered areas have been cleared and are used for unimproved pasture or are idle. Although the soils are somewhat droughty, they are fairly suitable as woodland and should be managed for this use or for wildlife habitat or recreation.

CAPABILITY UNIT VIIs-4

This unit consists of Kendaia and Lyons soils and of Leicester, Ridgebury, and Whitman soils that were mapped together. All of these soils developed in glacial till on uplands. They are very stony, nearly level or very gently sloping, and poorly drained or very poorly drained. Surface runoff is slow or very slow, and internal drainage is impeded by a water table that fluctuates seasonally. During most of the winter and in spring, the water table is at or near the surface.

These soils are mainly in cutover forest. Some areas, however, have been cleared or partly cleared and are used for unimproved pasture, and some areas are idle. Keeping brush under control encourages the growth of native grasses and legumes. These plants can furnish a fair amount of grazing, especially in dry periods. Other suitable uses for the soils are woodland and wildlife habitat. Generally, the development of ponds for wildlife is feasible on these soils.

CAPABILITY UNIT VIIIs-1

In this unit are two land types, Riverwash and Rock land. Riverwash is made up chiefly of coarse sand, gravel, and small stones that were deposited or reworked by floodwater along rivers and other streams. Rock land consists of gently sloping to steep areas in which more than 50 percent of the surface is occupied by exposed bedrock. In addition, some areas have loose stones and boulders on the surface.

The land in this unit is of little or no use for farming. Rock land can be used for some kinds of recreation.

Estimated Yields

Table 1 shows the estimated average yields per acre of the principal crops grown on soils in Litchfield County under two levels of management. The yields are averages over several years. Those in any one year may be affected by weather, insects, disease, and other factors. Several years of improved management may be necessary before yields are consistently increased.

The yields in columns A can be expected if the level of management is low. Under such management (1) lime, fertilizer, and manure are used in amounts that are not sufficient to produce maximum yields; (2) erosion is not controlled and drainage is inadequate; (3) improved varieties of crops and certified seed are not always used; (4) seedbeds are not always properly prepared; (5) insects and diseases are not adequately controlled; and (6) unimproved pasture is brushy, weedy, and poorly managed.

Yields in columns B reflect improved management. This level of management includes (1) the application of lime, manure, and fertilizer in sufficient amounts; (2) using suitable cropping systems and making use of crop

TABLE 1.—*Estimated average acre yields of principal crops*

[Yields in columns A are those expected under a low level of management; yields in columns B, under improved management. Absence of yield figure indicates that the crop is not commonly grown on the soil]

Soil[1]	Silage corn		Alfalfa hay		Mixed hay		Permanent pasture		Rotation pasture	
	A	B	A	B	A	B	A	B	A	B
	Tons	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Cow-acre-days*[2]	*Cow-acre-days*[2]	*Cow-acre-days*[2]	*Cow-acre-days*[2]
Alluvial land	—	—	—	—	—	—	50	90	—	—
Amenia silt loam, 0 to 3 percent slopes	13	24	2.5	4.5	2.0	4.0	70	130	100	255
Amenia silt loam, 3 to 8 percent slopes	13	24	2.5	4.5	2.0	4.0	70	130	100	255
Amenia silt loam, 8 to 15 percent slopes	12	22	2.0	4.0	1.7	3.5	60	110	85	230
Amenia stony silt loam, 3 to 8 percent slopes	—	—	—	—	1.7	—	60	—	—	—
Amenia stony silt loam, 8 to 15 percent slopes	—	—	—	—	1.5	—	55	—	—	—
Au Gres loamy fine sand	—	—	—	—	—	—	40	70	—	—
Belgrade silt loam, 0 to 3 percent slopes	13	24	3.5	4.5	2.0	4.0	70	130	100	255
Belgrade silt loam, 3 to 8 percent slopes	13	24	3.5	4.5	2.0	4.0	70	130	100	255
Bernardston silt loam, 3 to 8 percent slopes	13	22	3.5	4.5	2.0	4.0	70	130	100	255
Bernardston silt loam, 8 to 15 percent slopes	13	20	3.5	4.0	2.0	3.5	70	130	100	230
Bernardston stony silt loam, 3 to 8 percent slopes	—	—	—	—	1.7	—	60	—	—	—
Bernardston stony silt loam, 8 to 15 percent slopes	—	—	—	—	1.7	—	60	—	—	—
Birdsall silt loam	—	17	—	—	—	2.5	40	70	—	145
Branford loam, 3 to 8 percent slopes	11	24	3.0	4.5	1.5	4.0	55	100	75	255
Branford loam, 8 to 15 percent slopes	10	22	2.5	4.0	1.3	3.5	50	90	65	230
Charlton fine sandy loam, 0 to 3 percent slopes	12	24	2.5	5.0	1.7	4.5	60	110	85	285
Charlton fine sandy loam, 3 to 8 percent slopes	12	24	2.5	5.0	1.7	4.5	60	110	85	285
Charlton fine sandy loam, 3 to 8 percent slopes, eroded	10	22	2.0	4.5	1.5	4.0	55	100	75	255
Charlton fine sandy loam, 8 to 15 percent slopes	10	22	2.0	5.0	1.5	4.0	55	100	75	285
Charlton fine sandy loam, 8 to 15 percent slopes, eroded	9	20	2.0	4.5	1.2	3.5	50	90	60	255
Charlton fine sandy loam, 15 to 25 percent slopes	9	18	—	4.5	1.2	3.5	50	90	60	255
Charlton fine sandy loam, 25 to 35 percent slopes	—	—	—	—	—	—	50	—	—	—
Charlton stony fine sandy loam, 3 to 8 percent slopes	—	—	—	—	1.2	—	50	—	—	—
Charlton stony fine sandy loam, 8 to 15 percent slopes	—	—	—	—	1.2	—	50	—	—	—
Charlton stony fine sandy loam, 15 to 25 percent slopes	—	—	—	—	—	—	50	—	—	—
Copake loam, 0 to 3 percent slopes	13	22	2.5	4.5	1.5	4.0	55	100	75	255
Copake loam, 3 to 8 percent slopes	13	22	2.5	4.5	1.5	4.0	55	100	75	255
Copake loam, 8 to 15 percent slopes	12	20	2.5	4.0	1.5	3.5	55	100	75	230
Deerfield loamy fine sand, 0 to 3 percent slopes	7	16	1.5	3.5	1.0	3.0	40	70	50	200
Dover fine sandy loam, 0 to 3 percent slopes	14	24	3.0	4.5	1.7	4.0	60	110	85	255
Dover fine sandy loam, 3 to 8 percent slopes	14	24	3.0	4.5	1.7	4.0	60	110	85	255
Dover fine sandy loam, 8 to 15 percent slopes	12	22	2.5	4.0	1.5	3.5	55	100	75	230
Dover fine sandy loam, 15 to 25 percent slopes	10	20	—	3.5	1.2	3.0	50	90	60	200
Dover stony fine sandy loam, 3 to 8 percent slopes	—	—	—	—	1.2	—	50	—	—	—
Dover stony fine sandy loam, 8 to 15 percent slopes	—	—	—	—	1.2	—	50	—	—	—
Eel silt loam	14	26	3.5	4.5	2.0	4.0	70	130	100	255
Enfield silt loam, 0 to 3 percent slopes	13	26	3.5	5.0	2.0	4.5	70	130	100	285
Enfield silt loam, 3 to 8 percent slopes	13	26	3.5	5.0	2.0	4.5	70	130	100	285
Enfield silt loam, 8 to 15 percent slopes	13	24	3.5	4.5	2.0	4.0	70	130	100	255
Fredon silt loam	13	20	—	3.5	1.2	3.5	50	90	60	200
Genesee silt loam	14	28	3.5	5.0	2.0	4.5	70	130	100	285
Gloucester sandy loam, 3 to 8 percent slopes	9	16	2.5	4.0	1.2	3.0	50	90	60	230
Gloucester sandy loam, 8 to 15 percent slopes	7	14	2.0	4.0	1.0	3.0	50	90	50	230
Gloucester sandy loam, 15 to 25 percent slopes	—	12	—	3.5	1.0	2.5	40	70	50	200
Gloucester stony sandy loam, 3 to 8 percent slopes	—	—	—	—	1.0	—	40	—	—	—
Gloucester stony sandy loam, 8 to 15 percent slopes	—	—	—	—	1.0	—	40	—	—	—
Gloucester stony sandy loam, 15 to 25 percent slopes	—	—	—	—	—	—	40	—	—	—
Granby loamy fine sand	—	—	—	—	—	—	40	—	—	—
Groton gravelly sandy loam, 0 to 3 percent slopes	10	12	2.0	2.5	1.0	2.0	40	70	50	145
Groton gravelly sandy loam, 3 to 15 percent slopes	10	12	2.0	2.5	1.0	2.0	40	70	50	145
Hartland silt loam, 0 to 3 percent slopes	13	28	3.5	5.0	2.0	4.5	70	130	100	285
Hartland silt loam, 3 to 8 percent slopes	13	28	3.5	5.0	2.0	4.5	70	130	100	285
Hartland silt loam, 8 to 15 percent slopes	12	26	3.0	4.5	1.7	4.0	60	110	85	255
Hero loam, 0 to 3 percent slopes	14	22	2.5	4.0	1.7	3.5	70	130	85	230
Hero loam, 3 to 8 percent slopes	14	22	2.5	4.0	1.7	3.5	70	130	85	230
Hinckley gravelly sandy loam, 0 to 3 percent slopes	7	12	2.0	2.5	1.2	2.0	50	90	60	145
Hinckley gravelly sandy loam, 3 to 15 percent slopes	7	12	2.0	2.5	1.2	2.0	50	90	60	145
Hinckley gravelly loamy sand, 0 to 3 percent slopes	6	12	1.5	2.5	1.0	2.0	40	70	50	145
Hinckley gravelly loamy sand, 3 to 15 percent slopes	6	12	1.5	2.5	1.0	2.0	40	70	50	145
Hollis rocky fine sandy loam, 3 to 15 percent slopes	8	15	1.5	3.5	1.2	3.0	50	90	50	200
Kendaia silt loam	11	22	1.5	3.5	1.2	3.5	50	90	60	200
Leicester fine sandy loam	9	16	—	—	1.2	3.5	50	90	60	200
Leicester stony fine sandy loam	—	—	—	—	—	—	40	70	40	—
Limerick silt loam	9	20	—	—	1.2	3.5	50	90	60	200

See footnotes at end of table.

TABLE 1.—*Estimated average acre yields of principal crops*—Continued

Soil [1]	Silage corn		Alfalfa hay		Mixed hay		Permanent pasture		Rotation pasture	
	A	B	A	B	A	B	A	B	A	B
	Tons	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Cow-acre-days* [2]	*Cow-acre-days* [2]	*Cow-acre-days* [2]	*Cow-acre-days* [2]
Lyons silt loam	------	18	------	------	------	3. 0	40	70	40	170
Merrimac sandy loam, 0 to 3 percent slopes	10	18	3. 0	4. 0	1. 2	3. 0	50	90	60	230
Merrimac sandy loam, 3 to 8 percent slopes	10	18	3. 0	4. 0	1. 2	3. 0	50	90	60	230
Merrimac sandy loam, 8 to 15 percent slopes	8	16	2. 0	4. 0	1. 0	3. 0	40	70	50	230
Muck, shallow	------	------	------	------	------	------	40	70	------	------
Ondawa fine sandy loam	11	26	2. 5	4. 5	1. 5	4. 0	55	100	75	255
Paxton fine sandy loam, 0 to 3 percent slopes	12	24	2. 0	4. 5	2. 0	4. 0	70	130	100	255
Paxton fine sandy loam, 3 to 8 percent slopes	12	24	2. 0	4. 5	2. 0	4. 0	70	130	100	255
Paxton fine sandy loam, 3 to 8 percent slopes, eroded	11	22	1. 5	4. 5	1. 7	4. 0	60	110	85	255
Paxton fine sandy loam, 8 to 15 percent slopes	12	22	1. 5	4. 5	1. 7	4. 0	60	100	85	255
Paxton fine sandy loam, 8 to 15 percent slopes, eroded	10	20	1. 5	4. 0	1. 5	3. 5	55	100	75	230
Paxton fine sandy loam, 15 to 25 percent slopes	10	20	1. 5	4. 0	1. 2	3. 5	50	90	60	230
Paxton fine sandy loam, 15 to 25 percent slopes, eroded	------	------	1. 0	------	1. 0	------	40	------	50	------
Paxton fine sandy loam, 25 to 35 percent slopes	------	------	------	------	------	------	40	------	------	------
Paxton stony fine sandy loam, 3 to 8 percent slopes	------	------	------	------	1. 2	50	------	------	------	------
Paxton stony fine sandy loam, 8 to 15 percent slopes	------	------	------	------	1. 2	------	50	------	------	------
Paxton stony fine sandy loam, 15 to 25 percent slopes	------	------	------	------	------	------	40	------	------	------
Podunk fine sandy loam	11	24	2. 5	4. 0	1. 5	4. 5	55	100	75	255
Raynham silt loam	11	20	------	------	1. 0	3. 5	40	70	50	200
Ridgebury fine sandy loam	9	16	------	------	1. 0	3. 5	40	70	50	200
Ridgebury stony fine sandy loam	------	------	------	------	------	------	40	------	------	------
Rumney fine sandy loam	9	20	------	------	1. 0	3. 5	40	70	50	230
Saco silt loam	------	------	------	------	------	------	40	------	------	------
Scarboro loamy fine sand	------	------	------	------	------	------	40	------	------	------
Stockbridge loam, 0 to 3 percent slopes	14	24	2. 0	5. 0	2. 0	4. 5	70	130	100	285
Stockbridge loam, 3 to 8 percent slopes	14	24	2. 0	5. 0	2. 0	4. 5	70	130	100	285
Stockbridge loam, 3 to 8 percent slopes, eroded	13	22	1. 5	5. 0	1. 7	4. 5	60	110	85	285
Stockbridge loam, 8 to 15 percent slopes	14	22	1. 5	5. 0	1. 7	4. 5	60	110	85	285
Stockbridge loam, 8 to 15 percent slopes, eroded	12	20	1. 5	4. 5	1. 5	4. 0	55	100	75	255
Stockbridge loam, 15 to 25 percent slopes, eroded	------	------	------	------	1. 0	------	40	------	------	------
Stockbridge stony loam, 3 to 8 percent slopes	------	------	------	------	1. 2	------	50	------	------	------
Stockbridge stony loam, 8 to 15 percent slopes	------	------	------	------	1. 2	------	50	------	------	------
Stockbridge stony loam, 15 to 25 percent slopes	------	------	------	------	------	------	40	------	------	------
Suncook loamy fine sand	5	12	1. 0	2. 5	1. 0	2. 0	40	70	50	145
Sutton fine sandy loam, 0 to 3 percent slopes	11	22	2. 0	4. 0	1. 7	4. 0	60	110	85	230
Sutton fine sandy loam, 3 to 8 percent slopes	11	22	2. 0	4. 0	1. 7	4. 0	60	110	85	230
Sutton stony fine sandy loam, 0 to 3 percent slopes	------	------	------	------	1. 2	------	50	------	------	------
Sutton stony fine sandy loam, 3 to 8 percent slopes	------	------	------	------	1. 2	------	50	------	------	------
Terrace escarpments	------	------	------	------	1. 0	------	40	------	50	------
Tisbury and Sudbury soils, 0 to 3 percent slopes	11	22	2. 0	3. 5	1. 7	4. 0	60	110	85	230
Tisbury and Sudbury soils, 3 to 8 percent slopes	11	22	2. 0	3. 5	1. 7	4. 0	60	110	85	230
Walpole and Raynham soils	10	18	------	------	1. 0	3. 0	40	90	50	170
Wareham loamy fine sand, nonacid variant	9	16	1. 5	3. 0	1. 0	2. 5	40	70	50	170
Whitman stony fine sandy loam	------	12	------	------	------	------	40	------	------	------
Windsor loamy fine sand, 0 to 3 percent slopes	6	12	1. 5	2. 5	1. 0	2. 5	40	70	50	145
Windsor loamy fine sand, 3 to 8 percent slopes	6	12	1. 5	2. 5	1. 0	2. 5	40	70	50	145
Windsor loamy fine sand, 8 to 15 percent slopes	------	------	1. 0	------	1. 0	------	40	------	50	------
Woodbridge fine sandy loam, 0 to 3 percent slopes	13	20	2. 0	4. 0	1. 7	4. 0	60	110	85	230
Woodbridge fine sandy loam, 3 to 8 percent slopes	13	20	2. 0	4. 0	1. 7	4. 0	60	110	85	230
Woodbridge fine sandy loam, 8 to 15 percent slopes	11	18	1. 5	4. 0	1. 5	4. 0	55	100	75	230
Woodbridge stony fine sandy loam, 0 to 3 percent slopes	------	------	------	------	1. 5	------	55	------	------	------
Woodbridge stony fine sandy loam, 3 to 8 percent slopes	------	------	------	------	1. 5	------	55	------	------	------
Woodbridge stony fine sandy loam, 8 to 15 percent slopes	------	------	------	------	1. 5	------	55	------	------	------

[1] Yields are not given in this table for very stony, very rocky, and extremely rocky soils; Borrow and fill land, coarse material; Borrow and fill land, loamy material; Made land; Peat and Muck; Riverwash; and Rock land. These soils and land types generally are not used for the crops listed, though in places they are used for unimproved pasture.

[2] Cow-acre-days is a term used to express the carrying capacity of pasture. It is the number of days a year that 1 acre can be grazed, without injury to the pasture, by a cow giving 25 pounds of milk (3.5 percent fat) a day. In columns A, cow-acre-days is based on 75 percent utilization of forage growth under continuous grazing. In columns B, cow-acre-days is based on 85 percent utilization under rotation grazing.

residue; (3) draining and irrigating as needed; (4) controlling runoff and erosion; (5) controlling weeds, brush, insects, and diseases; (6) preparing seedbeds properly; and (7) selecting suitable crops and varieties. Improved management of pasture includes (1) applying fertilizer and lime; (2) controlling weeds and brush; (3) seeding mixtures of desirable forage plants; and (4) regulating grazing.

Yield data were obtained from cooperating farmers, the county agent, marketing and conservation agencies, farm records, and State agricultural experiment stations. At Windsor in Hartford County and at Storrs in Tolland County, experiments have been conducted on several major soils that also occur in Litchfield County. Yields have been estimated for the other soils, based on knowledge of physical and chemical properties that are known to affect crop growth.

Some yield estimates in table 1 are explained in the following paragraphs.

The yields of silage corn are for full-season varieties and include all field moisture; that is, the weight of the green crop as it comes from the field. Yields of alfalfa hay and of mixed hay (consisting of timothy or reed canarygrass, clover, and some alfalfa) include only 15 percent of the field moisture, which is the storage moisture content. The yields of alfalfa in pure stands are based on three cuttings of hay in an average year; those of mixed hay on two cuttings in an average year.

Rotation pasture consists of grass, clover, and alfalfa grown in mixture. A rotation pasture is used one or more years as part of a crop rotation or cropping system. In contrast, permanent pasture is used for seasonal grazing every year, but it does not include woodland pasture or meadows that are grazed following an early spring cutting of hay. The yields of rotation pasture and of permanent pasture were projected from studies of forage production at the University of Connecticut (*7*).

Use of Soils as Woodland

Woodland has contributed to the economy of Litchfield County for several centuries. It is a source of timber and wood products and provides watershed protection, recreation, wildlife preserves, and esthetic beauty (fig. 5).

At least two-thirds of the county is wooded. About 90 percent of the woodland is privately owned, and the rest is under State and municipal ownership. More than 50 percent of the private owners have less than 100 acres each, and 36 percent own between 100 and 500 acres each (*9*).

Through purchase and private donation, the State has acquired a total of 36,300 acres. Under its supervision are nine forest reserves that occupy 29,830 acres and 18 parks covering 6,470 acres. In addition to watershed protection, the State forests provide hunting and fishing, and the parks furnish boating, fishing, picnicking, hiking, swimming, and other forms of recreation.

Litchfield County can be divided into two parts on the basis of contrasting relief. The southern part is an area of low, smoothly rounded, drumloidal ridges on which dairying has been a farm enterprise since the land was first settled and cleared. Here, the woods generally occur on soils that are steep and stony or are poorly drained. To the north, particularly in the towns of Colebrook and Norfolk, is the southern edge of the highly dissected Berkshire Plateau. This part of the county is an area of steep, stony hillsides where bedrock crops out in many places. Here, the woodland is interrupted only by a few pastures and is most extensive at the higher elevations.

***Figure 5.*—A local sawmill that manufactures lumber from timber cut in Litchfield County.**

Four vegetative zones occur in Litchfield County (*4*, *23*). They are (1) hemlock-northern hardwoods-white pine, (2) hemlock-transition hardwoods-white pine, (3) central hardwoods-white pine, and (4) central hardwoods. Northern hardwoods include yellow birch, white birch, beech, and sugar maple. Among the central hardwoods are oak, hickory, red maple, and black birch. Transition hardwoods are intermingled species of northern hardwoods and central hardwoods.

The four zones occur successively from north to south; they are correlated roughly with temperature and, to a lesser extent, altitude (*4*). The composition of existing stands reflects the influence of soils, climate, and the history of land use in various areas of the county.

Woodland suitability groups

Just as soils are placed in capability classes, subclasses, and units according to their suitability for crops and pasture, they can be grouped according to their suitability for trees. Each woodland suitability group is made up of soils that are suitable for about the same kinds of trees, require similar practices for conserving soil and moisture, and have similar potential productivity for wood crops.

The potential productivity of a soil for trees is expressed as the site index, which is the average height, in feet, that a specified kind of tree, growing on that soil, will reach in 50 years. For the soils of Litchfield County, site indexes have been determined for mixed oaks and for white pine. The estimated site indexes are based on information obtained throughout New England.

Oaks and white pine generally do not grow at the same rate. For example, on the most productive soils in the

county, where the site index is 75 or more for mixed oaks, it is 70 or more for white pine. In places where the site index is between 65 and 74 for oaks, it is between 60 and 69 for white pine. On soils that are poorly suited to these trees, the site index is 45 to 54 for oaks and is less than 49 for white pine. Tables listing growth data have been developed for upland oaks (*15*) and white pine (*8*).

All the soils in one woodland suitability group are similar with respect to the limitations that affect management: plant competition, the hazard of windthrow, and restrictions on the use of equipment. The limitations are rated slight, moderate, or severe.

Competition from undesirable trees and other plants affects the establishment of planted or naturally occurring tree seedlings. The competition is *slight* if unwanted plants do not hinder the natural regeneration or growth of desirable species. It is *moderate* if the invading plants delay but do not prevent the establishment of desirable seedlings. Competition is *severe* if unwanted plants compete vigorously with desirable species and natural regeneration is difficult without chemical control, girdling, periodic restocking, or other special treatment.

Windthrow hazard is the risk of trees being blown over by wind, especially after thinning and harvest cutting. The hazard is *slight* if the normal development of roots is not restricted by bedrock, a hardpan, or a high water table. It is *moderate* if the subsoil provides good anchorage except at times when it is excessively wet. The hazard is *severe* if anchorage is poor, even when the soil is unsaturated, and root growth is seriously hindered by bedrock, a hardpan, or a permanent high water table near the surface.

Limitations on the use of equipment vary according to slope and other characteristics of the soils that restrict or prohibit the use of equipment commonly employed in planting, tending, and harvesting trees. The limitations are *slight* if there are few or no restrictions as to the kind of equipment or the time of year that equipment is used. Soils with slight limitations have good drainage, few surface stones, and slopes of less than 15 percent. The limitations are *moderate* if the use of equipment is limited by poor or very poor drainage for short periods early in spring and late in fall or if the soil is shallow and bedrock crops out in many places. Limitations are *severe* if slopes exceed 25 percent or if rock outcrops and large boulders are numerous and closely spaced.

Discussed in the following pages are the woodland suitability groups of the county. The names of soil series represented are mentioned in the description of each woodland group, but this does not mean that all the soils of a given series appear in the group. To find the names of all the soils in any given woodland group, refer to the "Guide to Mapping Units" at the back of this survey.

WOODLAND SUITABILITY GROUP 1

This group consists of moderately well drained, stony or nonstony soils that have slopes of less than 15 percent. These soils are of the Amenia, Belgrade, Eel, Hero, Podunk, Sudbury, Sutton, Tisbury, and Woodbridge series. They formed in a variety of materials, including loose to very firm glacial till, stratified sand and gravel, and recent alluvium. The Amenia, Belgrade, Eel, Sutton, and Woodbridge soils are medium textured or moderately coarse textured throughout, whereas the Hero, Podunk, Sudbury, and Tisbury soils are medium textured or moderately coarse textured to a depth of 2 to 2½ feet but are coarse textured below that depth.

The soils in this group are among the best in Connecticut for producing timber. The average site index for white pine is 70, and for mixed oaks it is 68. White pine and oaks grow rapidly because soil moisture and aeration are favorable. The soils generally have a water table that fluctuates rapidly early in spring, and consequently they hold enough moisture available for trees but are saturated for only short periods.

Competition from unwanted plants is moderate for oaks, but this can be reduced by thinning the stands and removing undesirable trees. In contrast, hardwoods compete severely with pines. In areas where hardwoods have been recently harvested, establishing white pine is difficult unless oak and red maple are kept from resprouting through the use of chemical growth inhibitors.

Windthrow is a moderate to severe hazard. The soils are temporarily saturated during heavy rains and do not provide secure anchorage. In addition, root systems are shallow and unstable on the Amenia and Woodbridge soils, for these soils contain a compact, slowly permeable layer.

Equipment limitations are only slight. Slopes are favorable for the operation of both wheeled and crawler-type vehicles most of the year. Early in spring, when the soil is thawing and wet, the use of wheeled vehicles may be limited for short periods.

White spruce is suitable for Christmas trees. It grows slowly and produces a dense, compact tree. On the other hand, Norway spruce and Douglas-fir grow rapidly and produce a tall, spindly tree. Also, Norway spruce is subject to attack by gall aphids and white pine weevils. Douglas-fir is more resistant to insect infestations, but it can be seriously damaged by browsing deer. Balsam fir is sometimes planted on cool, moist, northeast to northwest slopes at high elevations in the northern part of the county.

WOODLAND SUITABILITY GROUP 2

In this group are well-drained, stony or nonstony soils having slopes of less than 15 percent. These soils are of the Bernardston, Branford, Charlton, Copake, Dover, Enfield, Genesee, Hartland, Ondawa, Paxton, and Stockbridge series. They formed in a variety of material, including loose to very firm glacial till; stratified sand and gravel that were mantled, in places, with windblown silt; or recent alluvium. The Bernardston, Charlton, Dover, Genesee, Hartland, Paxton, and Stockbridge soils are medium textured or moderately coarse textured throughout the profile, but the Branford, Copake, Enfield, and Ondawa soils have underlying material consisting of sand and gravel.

The average site index is 66 both for white pine and for mixed oaks.

Plant competition is moderate for oaks. Removing undesirable species and poorly formed trees reduces competition, but control of resprouting on stumps is needed in some places. For white pine the competition from unwanted plants generally is severe. In mixed stands where white pine is favored, it may be necessary to eliminate competing hardwoods by cutting and chemical

control, though white pine competes successfully with hardwoods in the northern part of the county.

Windthrow is a moderate hazard on the Bernardston, Paxton, and Stockbridge soils, all of which have a compact, slowly permeable layer that restricts rooting. The hazard is only slight on the other soils of the group.

The use of equipment is only slightly limited. In spring the soils dry readily and trafficability for wheeled vehicles is not restricted.

White spruce and Douglas-fir grow well in plantations of Christmas trees. In fact, Douglas-fir may grow too rapidly on lower slopes. Norway spruce does well on upper slopes, but it may be infested by spruce gall aphids, or white pine weevil.

WOODLAND SUITABILITY GROUP 3

This group consists of well-drained, stony and nonstony Charlton, Dover, Gloucester, Paxton, and Stockbridge soils that have slopes exceeding 15 percent. The Charlton, Dover, and Gloucester soils occur on loose to firm glacial till; the Paxton and Stockbridge soils are on firm to compact, slowly permeable glacial till. Texture is generally moderately coarse throughout, but the Gloucester soils are underlain by coarse-textured material that contains many stones.

The average site index is 62 for white pine, and it is 60 for mixed oaks. These site indexes are lower than those on soils of the same series having slopes of less than 15 percent. The decrease likely is the result of more surface runoff and therefore less moisture in the soil available for plants.

Plant competition is moderate for mixed oaks but is severe for white pine. Removing undesirable species and poorly formed trees reduces competition, though this is difficult in steep areas where the use of equipment is severely limited.

Windthrow is a moderate hazard on the Paxton and Stockbridge soils, which contain a compact, slowly permeable layer that generally causes shallow rooting. On the other soils of the group, the hazard is only slight.

Equipment limitations are moderate to severe. On slopes of more than 25 percent, crawler-type vehicles should be used in preference to wheeled vehicles.

For Christmas trees, white spruce and Douglas-fir grow well on these soils. Norway spruce is suitable on upper slopes, but insects may damage the trees unless controlled.

WOODLAND SUITABILITY GROUP 4

This group consists of Alluvial land and poorly drained soils that developed in glacial till, stratified sand and gravel, or recent alluvium. These soils are of the Au Gres, Fredon, Kendaia, Leicester, Limerick, Raynham, Ridgebury, Rumney, Walpole, and Wareham series. Slopes are less than 3 percent. The Kendaia, Leicester, Limerick, Raynham, and Ridgebury soils are medium textured or moderately coarse textured throughout. The Au Gres, Fredon, Rumney, Walpole, and Wareham soils are medium textured or moderately coarse textured above the underlying material but are coarse textured in it.

The site index ranges from 50 to 69 for white pine and from 45 to 64 for mixed oaks. Soil moisture and aeration are less favorable in these soils than they are in the moderately well drained soils of group 1. Generally, the water table is high from late in fall to late in spring. Stagnated water and poor aeration commonly inhibit root development in spring when growth normally is active. Aeration is satisfactory, however, in places where the ground water is not stagnant but moves downslope. Also, many trees grow on mounds resulting from windthrow, and their upper roots are not affected by a high water table.

Plant competition is moderate for oaks but is severe for white pine. Red maple invades rapidly, for it is tolerant of excess moisture. Removing undesirable species reduces competition, though in places such thinning also increases the risk of windthrow.

The windthrow hazard is severe. A high water table, a compact layer in the Ridgebury soils, and local stoniness all are features that limit root development. Trees growing on saturated soils are unstable because their root system is shallow. In the 1938 hurricane, trees in poorly drained areas were severely damaged.

Equipment limitations are moderate. In places the use of wheeled vehicles is restricted late in fall and early in spring when the soils are saturated.

Most species planted for Christmas trees grow poorly on these soils. Competition from undesirable plants is severe in areas recently cleared; brush encroaches rapidly in old fields; and a high water table commonly limits root growth.

WOODLAND SUITABILITY GROUP 5

In this group are the Lyons and Whitman soils formed on glacial till; the Birdsall, Granby, and Scarboro soils formed on water-laid terraces; and the Saco soils formed on flood plains. All of these soils are very poorly drained and have slopes of less than 3 percent. The group also includes Muck, shallow; the very stony Kendaia-Lyons soils; and the very stony Leicester, Ridgebury, and Whitman soils.

The estimated site index ranges from 50 to 59 for white pine and from 45 to 64 for mixed oaks.

White pine and oaks are not abundant on these soils. Red oak is common but grows slowly. Tree growth generally is limited by prolonged waterlogging and poor aeration. The water table is high throughout the year, and water commonly is ponded in spring and early in summer. Only if summer is exceptionally dry does the water table fall below a depth of 24 inches. In many places the microrelief is irregular. Some oak trees grow on mounds resulting from windthrow, and the upper roots of these trees are not affected by a high water table.

Plant competition is severe for oaks and white pine. Red maple and other moisture-tolerant species invade rapidly. Thinning of stands to eliminate undesirable trees increases the risk of windthrow.

The windthrow hazard is severe because of shallow root systems and saturated soil.

Equipment limitations are severe. The use of wheeled vehicles generally is restricted most of the year, but crawler-type vehicles can be operated in dry periods when the water table is lower than normal.

Most trees planted for Christmas trees grow poorly on these soils. In addition, access for planting, tending, and harvesting is difficult.

WOODLAND SUITABILITY GROUP 6

In this group are Terrace escarpments and soils of the Deerfield, Gloucester, Groton, Hinckley, Merrimac, Suncook, and Windsor series. These soils are moderately coarse textured or coarse textured, and almost all of them are somewhat excessively drained or excessively drained. In most places slopes are less than 15 percent. The Groton, Hinckley, Merrimac, and Windsor soils formed in stratified sand and gravel; the Suncook soils, in recent alluvium; the Gloucester soils, in coarse-textured glacial till; and the moderately well drained Deerfield soils, in deep stratified sand. The Groton and Hinckley soils are gravelly throughout, and the Gloucester soils are stony in many places.

The site index for white pine ranges from 50 to 69 but averages 59. For mixed oaks the site index ranges from 45 to 64 and the average is 54. Trees grow slowly because the soils are droughty. Their available moisture capacity is low, and their moisture supply is depleted rapidly in spring. Consequently, the period of rapid growth is shortened.

Plant competition is moderate for mixed oaks and for white pine. Although invading plants commonly delay the growth of desirable species, intensive management is not needed. Brush encroaches slowly in abandoned open fields, but white pine that has been planted in recently cleared areas may compete with resprouting hardwoods. The growth of oaks or white pine can be increased by thinning the stand.

Windthrow is only a slight hazard because root systems are deep and provide secure anchorage for trees. Rapid percolation of water through the soil during heavy rainfall prevents waterlogging.

Limitations on the use of equipment generally are slight. In places where the slopes of Terrace escarpments are short and steep, operating vehicles is somewhat difficult. The Suncook soils are occasionally flooded for short periods.

White spruce, Douglas-fir, and Norway spruce are suitable for Christmas trees. Particularly on the Groton, Hinckley, and Windsor soils, growth is relatively slow and produces a dense, compact tree.

WOODLAND SUITABILITY GROUP 7

This group consists of very stony, chiefly medium-textured or moderately coarse textured soils that formed in loose to compact glacial till. They are the well drained Bernardston, Charlton, Gloucester, Paxton, and Stockbridge soils and the moderately well drained Amenia, Sutton, and Woodbridge soils. Slopes generally are less than 15 percent.

The average site index is 62 for white pine, and it is 61 for mixed oaks. These average site indexes are slightly lower than those for trees growing on nonstony or less stony soils of the same series. Natural stands respond well to management, but so many stones occur on and in the soils that managing the trees is difficult.

Plant competition is moderate for oaks but is severe for white pine. Undesirable trees compete vigorously with the desirable ones on the moderately well drained Amenia, Sutton, and Woodbridge soils. In white pine plantations, natural regeneration and growth are likely to be delayed unless competing plants are controlled.

Windthrow is a moderate to severe hazard. A compact, slowly permeable layer restricts root growth in the Amenia, Bernardston, Paxton, Stockbridge, and Woodbridge soils. Also, during heavy rains the Amenia, Sutton, and Woodbridge soils are saturated and provide poor anchorage for trees.

Limitations on the use of equipment are moderate or severe, depending on the size and spacing of stones and boulders. In some places both wheeled and crawler-type vehicles are of limited use.

White spruce, Douglas-fir, and Norway spruce planted for Christmas trees grow well on these soils. Douglas-fir and Norway spruce may grow too rapidly on the Amenia, Sutton, and Woodbridge soils. In places the trees must be planted by hand because the soils are too stony for equipment.

WOODLAND SUITABILITY GROUP 8

This group consists of very stony, well-drained, chiefly medium-textured to moderately coarse textured soils that have slopes exceeding 15 percent. These soils are of the Bernardston, Charlton, Gloucester, Paxton, and Stockbridge series. In the Bernardston, Paxton, and Stockbridge soils, the underlying material includes a compact, slowly permeable layer.

The site index ranges from 55 to 74 for mixed oaks and from 50 to 69 for white pine. The average site index is between 55 and 64 for oaks and between 50 and 59 for white pine.

Although these steep, stony soils produce a satisfactory growth of trees, they are difficult to manage because the use of equipment is so severely limited. The soils are suitable mainly as watershed and for wildlife and recreation.

Adapted species planted for Christmas trees make satisfactory growth, but the plantations are very difficult to manage. Moreover, the trees must be planted and harvested by hand.

WOODLAND SUITABILITY GROUP 9

The soils in this group are only a few inches to about 20 inches deep to bedrock. They are of the Farmington, Hollis, Holyoke, and Shapleigh series. These soils are well drained to somewhat excessively drained, are moderately coarse textured to medium textured, and have slopes of less than 15 percent. The average depth to bedrock is 12 to 14 inches. In some places outcrops of rock occupy as much as 50 percent of the surface.

The average site index is 58 for white pine and is 48 for mixed oaks. Trees generally grow rather slowly because the soils are shallow. In places, however, the available moisture is sufficient for trees to grow fairly well. Where the underlying bedrock is highly fractured, roots can penetrate to a considerable depth and use moisture that is channeled through the cracks.

Plant competition is moderate for white pine and for oaks. White pine is suitable for planting, though it grows more slowly on these soils than on soils having a higher available moisture capacity.

The hazard of windthrow is severe. On these shallow soils, root systems ordinarily are poorly developed and unstable. The trees are anchored more securely, however, in areas where roots can penetrate cracks in the bedrock.

The use of equipment is moderately limited in most places, though the degree of limitation depends on the size and spacing of rock outcrops.

White pine and Douglas-fir are suitable for Christmas trees in areas where the soil is deeper than 12 to 18 inches, but growth may be too slow on droughty ridgetops and upper slopes.

WOODLAND SUITABILITY GROUP 10

This group consists of shallow, very rocky or extremely rocky soils that have slopes of more than 15 percent. These soils are of the Farmington, Hollis, Holyoke, and Shapleigh series. Their average depth to bedrock is 10 to 12 inches. The soils are well drained to somewhat excessively drained and are moderately coarse textured to medium textured.

The estimated site index ranges from 50 to 59 for white pine and from 45 to 54 for mixed oaks. Trees generally grow slowly because the soils are shallow and can hold only a limited supply of available moisture.

Plant competition is moderate for oaks and for white pine.

Generally, windthrow is a severe hazard because root systems are shallow. Where roots can penetrate cracks in the rocks, however, the trees are anchored more securely.

The equipment limitations are severe. Steep slopes and many rock outcrops restrict the use of most kinds of equipment.

Christmas tree plantings generally are unsatisfactory. Growth is poor, and management is very difficult.

WOODLAND SUITABILITY GROUP 11

This group consists of miscellaneous land types that are unsuitable for the production of wood crops but commonly are useful as watershed and wildlife habitat. These land types are Borrow and fill land, coarse material; Borrow and fill land, loamy material; Made land; Peat and Muck; Riverwash; and Rock land. Christmas tree plantings generally are not suitable on this land, though white spruce can be planted experimentally in borrow areas where a sod cover has been established.

Engineering Uses of Soils [2]

Some soil properties are of special interest to engineers, because they affect the construction and maintenance of roads, airports, and pipelines, the foundations of buildings, facilities for storing water, structures for controlling erosion, drainage systems, and systems for disposing of sewage. Among the properties most important to engineers are permeability to water, shear strength, compaction characteristics, soil drainage, shrink-swell characteristics, grain size, plasticity, and reaction. Also important are depth to bedrock or to sand and gravel, depth to water table, flooding hazard, and relief. Such information is made available in this subsection. Engineers can use it to—

1. Make soil and land use studies that will aid in selecting and developing industrial, commercial, residential, and recreational sites.
2. Make preliminary estimates of the engineering properties of soils in planning agricultural drainage systems, farm ponds, irrigation systems, and diversion terraces.
3. Make preliminary evaluations of soil and ground conditions that will aid in selecting locations for highways, airports, pipelines, and cables and in planning detailed investigations at the selected locations.
4. Locate probable sources of gravel and other construction materials.
5. Correlate performance of engineering structures with soil mapping units, and thus develop information for overall planning that will be useful in designing and maintaining certain engineering practices and structures.
6. Determine the suitability of soils for cross-country movement of vehicles and construction equipment.
7. Supplement information obtained from other published maps and reports and from aerial photographs.
8. Develop other preliminary estimates for construction purposes pertinent to the particular area.
9. Determine runoff characteristics of watersheds.

With the use of the soil map for identification, the engineering interpretations in this subsection can be useful for many purposes. It should be emphasized that they may not eliminate the need for sampling and testing at the site of specific engineering works involving heavy loads and where the excavations are deeper than the depths of layers here reported. Even in these situations, the soil map is useful for planning more detailed field investigations and for suggesting the kinds of problems that may be expected.

Each kind of soil has local variations that affect engineering performance or design. The interpretations in this subsection are based on laboratory test data and field experiences of engineers and indicate the average conditions for each kind of soil. Further, the interpretations are based primarily on the characteristics of the upper 5 feet of soil. The characteristics of deeper materials can be estimated from surficial geology reports and ground water reports of the U.S. Geological Survey.

Much of the information in this subsection is in tables 2, 3, and 4. Table 2 lists engineering data that were obtained when selected soils in the county were tested. In table 3 are estimated engineering properties of all the soils in the county, and in table 4 are engineering interpretations of the soils.

Some of the terms used by soil scientists may be unfamiliar to engineers, and some words have a special meaning in soil science. Many of these terms are defined in the Glossary at the back of this publication.

Engineering classification systems

Most highway engineers classify soil materials according to the system approved by the American Association of State Highway Officials (AASHO) (*1*). In this system, soil materials are classified in seven principal groups. The groups range from A-1, which is gravelly soil of high bearing capacity, to A-7, which consists of

[2] THEODORE R. WIBE, State conservation engineer, Soil Conservation Service, assisted in preparing this subsection.

TABLE 2.—*Engineering*

[Tests performed by the Connecticut State Highway Department, Division of Soils and Foundations, in accordance

Soil name and location	Parent material	Report No.	Depth	Moisture-density [1] Maximum dry density	Moisture-density [1] Optimum moisture
		S-64-Conn-	*Inches*	*Lb. per cu. ft.*	*Percent*
Kendaia silt loam: 0.75 mile S. of intersection of Route 41 and Herrick Road, town of Sharon. (Modal profile)	Glacial till.	3-6-1	0-10	(5)	(5)
		3-6-2	12-24	140	10
		3-6-3	24-48	128	12
Kendaia very stony silt loam: 1 mile N. of West Side Pond, Goshen. (B and C horizons coarser textured than modal)	Glacial till.	3-5-1	4-14	110	16
		3-5-2	22-38	120	10
		3-5-3	38-60	123	10
Kendaia very stony silt loam: 2 miles SE. of Lakeville, town of Salisbury, on Norton Hill Road. (C horizon coarser textured than modal)	Glacial till.	3-4-1	8-20	104	23
		3-4-2	28-48	114	15
Paxton stony fine sandy loam: 1.3 miles NE. of Bethlehem Center and 0.25 mile S. of junction of Routes 61 and 132. (Modal profile)	Glacial till.	3-2-1	0-6	(5)	(5)
		3-2-2	6-16	115	18
		3-2-3	23-48	121	12
Paxton very stony very fine sandy loam: 1.7 miles S. of Bantam Center, town of Morris, on Morris Hill Road. (Finer textured than modal)	Glacial till.	3-1-1	5-15	104	18
		3-1-2	15-22	114	15
		3-1-3	24-48	118	13
Paxton very stony fine sandy loam: 0.2 mile SW. of Route 183 on State Line Hill Road, town of Norfolk. (Coarser textured than modal)	Glacial till.	3-3-1	6-17	108	9
		3-3-2	25-48	124	10
Whitman stony fine sandy loam: 0.35 mile S. of Morris Center on Route 61. (Modal profile)	Glacial till.	3-7-1	0-12	(5)	(5)
		3-7-2	16-27	121	9
		3-7-3	27-84	127	9
Whitman very stony fine sandy loam: 1.2 miles W. of New Milford-Washington town line on Route 134, New Milford. (Modal profile, nonacid)	Glacial till.	3-9-1	14-24	118	11
		3-9-2	24-42	124	10
		3-9-3	53-86	121	7
0.9 mile SW. of Goshen Center on Bentley Road. (IIC horizon finer textured than modal, nonacid)	Glacial till.	3-8-1	16-28	120	11
		3-8-2	28-42	122	12
		3 8 3	42-72	121	14

[1] Based on "The Moisture-Density Relations of Soils Using 5.5-lb. Rammer and 12-in. Drop," AASHO Designation T 99, Method A.

[2] Mechanical analyses according to the AASHO Designation: T 88. Results by this procedure frequently may differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analyses used in this table are not suitable for use in naming textural classes for soil. Laboratory test data corrected for amount discarded in field sampling.

test data

with standard procedures of the American Association of State Highway Officials (AASHO) (*1*)]

Mechanical analysis [2]										Liquid limit	Plasticity index	Classification	
Percentage passing sieve—						Percentage smaller than—							
3-in.	¾-in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.			AASHO [3]	Unified [4]
-------	100	99	97	86	71	59	37	11	4	[6] NP	[6] NP	A-4(7)	ML
99	99	91	87	80	52	42	24	10	7	NP	NP	A-4(3)	ML
99	97	90	86	78	57	48	26	11	6	NP	NP	A-4(4)	ML
99	99	96	92	80	50	40	27	11	8	NP	NP	A-4(3)	SM-
99	96	92	88	74	35	29	19	12	8	NP	NP	A-2-4(0)	SM
-------	100	95	91	75	34	27	16	9	7	NP	NP	A-2-4(0)	SM
-------	98	96	94	89	61	48	30	11	6	NP	NP	A-4(5)	ML
99	95	91	88	75	58	44	28	10	6	NP	NP	A-4(5)	ML
-------	100	97	94	85	53	41	25	10	6	NP	NP	A-4(4)	ML
99	90	81	77	71	41	34	23	11	6	NP	NP	A-4(1)	SM
-------	100	95	90	76	40	32	22	13	8	NP	NP	A-4(1)	SM
97	96	92	88	78	45	39	24	10	6	NP	NP	A-4(2)	SM
-------	100	97	93	82	48	38	24	10	5	NP	NP	A-4(3)	SM
-------	100	98	93	85	49	39	26	13	7	NP	NP	A-4(3)	SM
99	74	64	60	53	28	22	13	4	2	NP	NP	A-2-4(0)	SM-GM
99	86	80	74	70	40	30	18	10	8	NP	NP	A-4(1)	SM
-------	98	96	94	76	48	41	27	10	6	NP	NP	A-4(3)	SM
99	96	93	87	74	39	30	19	10	7	NP	NP	A-4(1)	SM
99	96	88	83	72	39	30	19	10	8	NP	NP	A-4(1)	SM
-------	100	97	94	85	46	35	21	12	9	NP	NP	A-4(2)	SM
-------	95	92	88	80	33	28	19	10	7	NP	NP	A-2-4(0)	SM
-------	100	97	95	86	55	38	19	9	6	NP	NP	A-4(4)	ML
-------	100	99	98	88	54	44	28	14	10	NP	NP	A-4(4)	ML
-------	96	94	91	82	53	46	35	21	15	NP	NP	A-4(4)	ML
98	98	96	95	85	56	50	40	27	17	NP	NP	A-4(4)	ML

[3] Based on Standard Specifications for Highway Materials and Methods of Sampling and Testing (Pt. 1, Ed 8): The Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes, AASHO Designation M 145-49 (*1*).
[4] Based on the Unified Soil Classification System, Technical Memorandum No. 3-357, Volume 1, Waterways Experiment Station, Corps of Engineers, March 1953 (*22*).
[5] Not suitable for compaction.
[6] Nonplastic.

TABLE 3.—*Estimated engineering*

[Dashed lines indicate information is not available for an estimate, or does not apply. Alluvial land (Am); Borrow and fill land, coarse are not listed in the table. These land types are too variable

Soil series and map symbols	Depth to bedrock	Depth to seasonal high water table	Depth from surface	Classification		
				USDA texture	Unified	AASHO
	Feet	*Inches*	*Inches*			
Amenia (AnA, AnB, AnC, AoB, AoC, ApC).	5+	15–20	8–26	Loam	ML, CL	A–4, A–6
			26–60	Gravelly loam	ML, CL, SM, SC	A–4, A–2
Au Gres (Au)	10+	0–8	8–60	Loamy fine sand	SW, SP, SM	A–2, A–3
Belgrade (BaA, BaB)	10+	15–20	8–60	Silt loam	ML, CL	A–4
Bernardston (BqB, BqC, BuB, BuC, BwD).	5+	[2] 48+	8–26	Silt loam, channery silt loam	SM, ML	A–4
			26–60	Channery silt loam (fragipan)	SM, ML	A–4
Birdsall (Bz)	10+	0	8–60	Silt loam	ML, SM	A–4
Branford (BoB, BoC)	10+	48+	8–26	Loam	SM, SP–SM, ML	A–4
			26–60	Sand and gravel	GP, GW, GM, SP, SW, SM	A–1, A–2
Charlton (CaA, CaB, CaB2, CaC, CaC2, CaD, CaE, ChB, ChC, ChD, CrC, CrD).	5+	48+	8–30	Fine sandy loam, gravelly fine sandy loam.	SM	A–2, A–4
			30–60	Gravelly fine sandy loam, gravelly sandy loam.	SM	A–2
Copake (CwA, CwB, CwC)	10+	48+	8–24	Loam, gravelly loam, fine sandy loam, gravelly fine sandy loam.	SM	A–2
			24–60	Sand and gravel	SW, SP–SM, GW, GP	A–1, A–2
Deerfield (DeA)	10+	15–20	8–60	Loamy fine sand, fine sand	SP, SM	A–2, A–3
Dover (DoA, DoB, DoC, DoD, DvB, DvC).	5+	48+	8–30	Fine sandy loam	SM	A–2, A–4
			30–42	Fine sandy loam, gravelly fine sandy loam, sandy loam, gravelly sandy loam.	SM	A–2
Eel (Ee)	10+	[3] 15–20	8–60	Silt loam, very fine sandy loam.	ML, SM	A–4
Enfield (EsA, EsB, EsC)	10+	48+	8–24	Silt loam, very fine sandy loam.	ML	A–4
			24–60	Sand and gravel	SW, SP, SM, GW, GP, GM	A–1, A–2
Farmington (FaC, FaE, FmC, FmE).	1–2	[4] 48+	8–18	Silt loam	ML	A–4
			18	Bedrock.		
Fredon (Fr)	10+	0–8	8–26	Fine sandy loam, silt loam	ML, SM	A–4
			26–60	Sandy loam	SM, SP–SM	A–2, A–4
Genesee (Gf)	10+	[3] 48+	8–60	Silt loam, very fine sandy loam.	ML, SM	A–4
Gloucester (GaB, GaC, GaD, GbB, GbC, GbD, GeC, GeE).	5+	48+	8–24	Sandy loam, gravelly sandy loam.	SM	A–2
			24–60	Gravelly loamy sand, gravelly coarse sand,	SM, SP–SM, GM	A–2, A–1
Granby (Gn)	10+	0	8–60	Loamy fine sand, sand	SW, SP, SM	A–1, A–2, A–3
Groton (GrA, GrC)	10+	48+	8–12	Gravelly sandy loam, gravelly loamy sand.	SM, SP–SM	A–2
			12–60	Sand and gravel	GP, GW, GM, SP, SW, SM	A–1

See footnotes at end of table.

properties of the soils

material (Bk); Borrow and fill land, loamy material (Bl); Made land (Ma); Muck, shallow (Pm); Riverwash (Re); and Rock land (Rh) to be rated or are not suitable for engineering uses]

Percentage passing sieve—					Permea-bility	Available moisture capacity	Optimum moisture content for com-paction [1]	Maximum dry density [1]	Reaction
3-inch	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)					
					Inches per hour	*Inches per inch of soil*	*Percent*	*Lbs. per cu. ft.*	*pH*
90–100	90–100	85–95	75–90	50–75	0. 63–2. 0	0. 17–0. 23	10–20	105–130	5. 6–7. 8
85–100	75–95	70–90	55–80	35–65	<0. 20	0. 12–0. 16	10–15	115–130	7. 4–8. 4
----------	95–100	90–95	85–95	5–30	2. 0–20. 0	0. 05–0. 08	9–15	105–110	4. 5–5. 5
----------	95–100	90–100	85–95	60–90	0. 63–2. 0	0. 20–0. 24	12–18	95–110	5. 1–6. 5
85–100	75–90	70–85	60 80	45–75	0. 63–2. 0	0. 18–0. 24	10–20	110–120	4. 5–5. 5
80–90	70–85	65–80	55–65	40–70	<0. 20	0. 15–0. 21	10–15	120–130	4. 5–6. 0
----------	95–100	90–100	60–95	40–70	0. 63–2. 0	0. 20–0. 24	10–20	90–120	5. 6–6. 0
90–100	85–95	80–90	60–70	45–60	0. 63–2. 0	0. 16–0. 22	10–19	100 125	4. 5–5. 0
80–100	45–70	35–65	15–40	3–25	>20. 0	0. 04–0. 08	6–12	110–130	4. 5–5. 0
85–100	75–95	70–90	50–60	20–40	0. 63–6. 3	0. 15–0. 20	9–18	105–115	5. 1–6. 0
85–95	60–80	50–75	40–65	15–30	2. 0–6. 3	0. 12–0. 16	12–20	105–125	5. 6–6. 0
90–100	75–95	65–85	45–70	15–35	0. 63–6. 3	0. 12–0. 17	10–15	110–120	5. 6–7. 3
80–100	45–95	35–70	10–40	3–20	>20. 0	0. 04–0. 08	9–12	115–135	7. 4–8. 4
----------	95–100	90–100	80–95	3–30	2. 0–6. 3	0. 04–0. 08	11–17	100–110	5. 1–6. 5
95–100	90–95	85–95	60–70	20–40	0. 63–6. 3	0. 15–0. 20	9–18	105–115	6. 6–7. 3
95–100	80–90	70–85	45–65	15–30	2. 0–6. 3	0. 12–0. 16	12–20	105–125	7. 4–8. 4
----------	95–100	90–100	60–95	40–70	0. 63–2. 0	0. 18–0. 24	10–18	95–120	5. 6–7. 3
95–100	90–100	85–100	60–80	55–75	0. 63–2. 0	0. 20–0. 24	15–19	100–110	5. 1–5. 5
80–100	40–80	35–70	10–40	3–20	>20. 0	0. 04–0. 08	9–15	110–135	5. 1–5. 5
95–100	90–100	80–95	60–80	55–75	0. 63–2. 0	0. 16–0. 22	10–20	100–120	6. 1–7. 3
----------	95–100	90–95	65–80	45–70	0. 63–2. 0	0. 14–0. 20	10–20	100–120	5. 6–7. 3
95–100	85–95	80–90	40–65	10–40	0. 63–6. 3	0. 12–0. 16	10–15	110–125	6. 1–8. 4
----------	95–100	90–100	60–95	40–70	0. 63–2. 0	0. 18–0. 24	10–18	95–120	5. 6–7. 8
85–100	65–95	60–85	45–65	15–35	2. 0–6. 3	0. 12–0. 16	10–13	115–120	5. 1–5. 5
85–100	45–80	40–70	20–40	10–25	2. 0–20. 0	0. 06–0. 12	8–12	115–130	5. 1–5. 5
----------	95–100	90–100	60–90	2–35	2. 0–6. 3	0. 04–0. 08	10–20	90–120	6. 6–8. 4
85–100	55–80	45–65	25–45	10–35	2. 0–6. 3	0. 10–0. 16	10–15	115–125	5. 6–7. 3
80–95	45–70	35–60	15–35	3–20	>20. 0	0. 04–0. 08	6–12	115–130	7. 4–8. 4

TABLE 3.—*Estimated engineering properties*

Soil series and map symbols	Depth to bed-rock	Depth to seasonal high water table	Depth from surface	Classification: USDA texture	Classification: Unified	Classification: AASHO
	Feet	*Inches*	*Inches*			
Hartland (HbA, HbB, HbC)	10+	48+	8–60	Silt loam, very fine sandy loam.	SM, ML	A–4, A–2
Hero (HeA, HeB)	10+	15–20	8–27	Silt loam, gravelly silt loam	ML, SM	A–4
			27–60	Sand and gravel	SP, SW, SM, GP, GW, GM	A–1
Hinckley (HkA, HkC, HmA, HmC).	10+	48+	8–24	Gravelly sandy loam, gravelly loamy sand.	SM, SP–SM	A–2
			24–60	Sand and gravel	GP, GW, GM, SP, SW, SM	A–1, A–2
Hollis (HoC, HrC, HrE, HxC, HxE).	1–2	[4] 48+	1–15	Fine sandy loam, gravelly fine sandy loam.	SM	A–2, A–4
			15	Bedrock.		
Holyoke (HyC, HzE)	1–2	[4] 48+	1–16	Silt loam, gravelly silt loam	SM	A–4
			16	Bedrock.		
Kendaia (Ka, Ke) (For properties of Lyons soils, in mapping unit Ke, refer to the Lyons series.)	5+	0–8	8–24	Silt loam, loam	ML, CL	A–4, A–6
			24–60	Silt loam, loam, gravelly silt loam, gravelly loam.	ML, CL, SM	A–4, A–2
Leicester (Lc, Le, Lg) (For properties of the Ridgebury and Whitman soils in mapping unit Lg, refer to their respective series.)	5+	0–8	8–25	Fine sandy loam, gravelly fine sandy loam.	SM	A–2, A–4
			25–60	Gravelly fine sandy loam, gravelly sandy loam.	SM	A–2
Limerick (Lm)	10+	[3] 0–8	8–60	Silt loam, very fine sandy loam.	ML, SM	A–4
Lyons (Ly)	5+	0	8–22	Silt loam, gravelly silt loam	ML, CL, OL	A–4, A–6
			22–60	Gravelly loam	ML, CL, SM	A–4
Merrimac (MyA, MyB, MyC)	10+	48+	8–26	Sandy loam, gravelly sandy loam, loamy sand, gravelly loamy sand.	SM, SP–SM	A–1, A–2
			26–40	Sand and gravel	SW, SP, SM, GW, GP, GM	A–1, A–2
Ondawa (On)	10+	[3] 48+	8–32	Fine sandy loam, sandy loam	SM	A–2
			32–60	Sandy loam, fine sandy loam, sand and gravel.	SM, SP–SM	A–2, A–1
Paxton (PbA, PbB, PbB2, PbC, PbC2, PbD, PbD2, PbE, PdB, PdC, PdD, PeA, PeC, PeD).	5+	[2] 48+	8–27	Fine sandy loam, gravelly fine sandy loam.	SM	A–4, A–2
			27–60	Gravelly sandy loam, gravelly fine sandy loam.	SM	A–2, A–4
Peat and Muck (Pk)	10+	0	----	----	Pt	----
Podunk (Po)	10+	15–20	8–32	Fine sandy loam, sandy loam	SM	A–2
			32–60	Sandy loam, fine sandy loam, sand and gravel.	SM, SP–SM	A–2, A–1
Raynham (Rc)	10+	0–8	8–60	Silt loam, very fine sandy loam	ML, SM	A–4, A–2
Ridgebury (Rd, Rg)	5+	0–8	8–20	Fine sandy loam, gravelly fine sandy loam.	SM, ML	A–4, A–2
			20–42	Fine sandy loam (fragipan)	SM	A–4, A–2
Rumney (Ru)	10+	[3] 0–8	8–34	Fine sandy loam, sandy loam	SM	A–2
			34–60	Sandy loam, sand and gravel	SM, SP–SM	A–2, A–1

See footnotes at end of table.

of the soils—Continued

Percentage passing sieve—					Permea-bility	Available moisture capacity	Optimum moisture content for com-paction [1]	Maximum dry density [1]	Reaction
3-inch	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)					
					Inches per hour	*Inches per inch of soil*	*Percent*	*Lbs. per cu. ft.*	*pH*
----------	95–100	95–100	80–100	20–65	0. 63–2. 0	0. 14–0. 22	10–18	100–120	4. 5–5. 5
95–100	85–95	65–90	55–80	45–70	0. 63–2. 0	0. 17–0. 23	10–20	100–120	6. 1–7. 3
80–95	45–70	35–60	15–35	3–20	2. 0–20. 0	0. 12–0. 16	10 15	110–125	6. 6–8. 4
85–100	55–80	45–65	25 45	10–35	2. 0–20. 0	0. 07–0. 16	10–15	115–125	4. 5–5. 0
80–100	45–70	35–60	15–35	3–20	>20. 0	0. 04–0. 08	6–12	115–130	5. 1–5. 5
85–100	75–100	70–95	50–75	30–50	0. 63–6. 3	0. 14–0. 18	10–20	100–120	4. 5–5. 0
85–100	75–100	70–95	60–80	50–65	0. 63–2. 0	0. 20–0. 24	10–20	100–115	4. 5–5. 5
90–100	90–100	80–95	75–90	50–75	0. 63–2. 0	0. 17–0. 23	10–20	105–130	6. 6–8. 4
85–100	75–95	65–85	55–80	35–65	<0. 20	0. 12–0. 16	10–15	115–130	7. 4–8. 4
85–100	80–95	75–90	45–60	20–40	0. 63–2. 0	0. 15–0. 20	9–18	105–115	5. 1–5. 5
85–95	65–85	50–75	25–45	15–30	2. 0–6. 3	0. 12–0. 16	12–20	105–125	5. 1–5. 5
----------	95–100	90–100	60–95	40–70	0. 63–2. 0	0. 18–0. 24	10–18	95–120	5. 6–7. 3
90–100	85–100	80–95	70–85	50–75	0. 63–2. 0	0. 20–0. 24	12–20	90 110	5. 6–7. 3
85–100	70–95	65–80	55–75	40–65	<0. 20	0. 12–0. 16	10–18	100–120	7. 4–8. 4
95–100	90–95	70–90	35–50	10 35	2. 0–6. 3	0. 12–0. 16	10–15	100–115	5. 1–6. 0
80–95	45–70	35–65	10–40	3–20	>20. 0	0. 04–0. 08	9–12	120–135	5. 1–6. 0
----------	95–100	90–100	50–65	20–35	0. 63–6. 3	0. 14–0. 18	10–15	100 120	5. 1–5. 5
90–100	75–95	60–90	35–55	10–30	2. 0–20. 0	0. 10–0. 16	9–12	110–125	5. 1–5. 5
90–100	65–95	60–90	45–75	25–45	0. 63–6. 3	0. 18–0. 22	10–16	110–120	5. 1–6. 0
85–95	60–90	50–80	35–65	15–45	<0. 20	0. 16–0. 20	9–12	120–130	5. 1–6. 0
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----------	95–100	90–100	50–65	20–35	0. 63–6. 3	0. 14–0. 18	10–15	100–120	4. 5–5. 5
90–100	75–95	60–90	35–55	10–30	2. 0–20. 0	0. 10–0. 16	9–12	110–125	5. 1–5. 5
----------	95–100	95–100	80–100	20–65	0. 63–2. 0	0. 14–0. 22	10–18	95–120	6. 1–6. 5
90–100	80–95	70–90	55–80	35–55	0. 63–6. 3	0. 18–0. 22	9–15	115–130	5. 1–5. 5
85–95	75–90	60–85	50–75	20–45	<0. 20	0. 14–0. 18	8–12	120–135	5. 1–5. 5
----------	95–100	90–100	50–65	20–35	0. 63–6. 3	0. 14–0. 18	10–15	100–120	5. 1–5. 5
90–100	75–95	60–90	35–55	10–30	2. 0–20. 0	0. 10–0. 16	9–12	110–125	5. 1–5. 5

TABLE 3.—*Estimated engineering properties*

Soil series and map symbols	Depth to bed-rock	Depth to seasonal high water table	Depth from surface	Classification: USDA texture	Classification: Unified	Classification: AASHO
	Feet	*Inches*	*Inches*			
Saco (Sb)	10+	0	10–60	Silt loam	ML, CL, OL	A–4, A–6
Scarboro (Sf)	10+	0	10–28	Loamy fine sand, sand	SM, SP–SM	A–1, A–2, A–3
			28–60	Sand, sand and gravel	SW, SP, SM, GW, GP, GM	A–1, A–2, A–3
Shapleigh (SkC, SkE, SmC, SmE)	1–2	[2] 48+	1–16	Sandy loam, gravelly sandy loam.	SM	A–2, A–4
			16	Bedrock.		
Stockbridge (SnA, SnB, SnB2, SnC, SnC2, SnD2, SpB, SpC, SpD, SrC, SrD).	5+	48+	8–26	Loam	ML, CL	A–4, A–6
			26–60	Loam, gravelly loam	ML, CL, SM, SC	A–4
Sudbury (mapped only with Tisbury soils.)	10+	15–20	8–24	Fine sandy loam, sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM, SP–SM	A–1, A–2
			24–60	Sand and gravel	SW, SP, SM, GW, GP, GM	A–1, A–2
Suncook (St)	10+	[3] 48+	8–24	Loamy sand	SW, SP–SM, SM	A–1, A–2, A–3
			24–60	Sand and gravel	SW, SP, SM, GW, GP, GM	A–1, A–2
Sutton (SvA, SvB, SwA, SwB, SxA, SxC.)	5+	15–20	8–27	Fine sandy loam, gravelly fine sandy loam.	SM	A–2, A–4
			27–60	Gravelly fine sandy loam, gravelly sandy loam.	SM	A–2
Terrace escarpments (Tg)	10+	48+	8–60	Sandy loam, loamy sand, sand and gravel.	SP, SW, SM, GP, GW, GM	A–1, A–2, A–3
Tisbury (TwA, TwB) (For properties of the Sudbury soils in these mapping units, refer to the Sudbury series.)	10+	15–20	8–24	Silt loam, very fine sandy loam	ML	A–4
			24–60	Sand and gravel	SW, SP, SM, GW, GP, GM	A–1, A–2
Walpole (Wl) (For properties of the Raynham soils in this mapping unit refer to the Raynham series.)	10+	0–8	8–26	Sandy loam, fine sandy loam	SM, SP–SM	A–1, A–2
			26–60	Sand and gravel	SW, SP, SM, GW, GP, GM	A–1, A–2
Wareham (Wmx)	10+	0–8	8–60	Sand	SW, SP, SM	A–1, A–2, A–3
Whitman (Wp)	5+	0	10–26	Fine sandy loam, gravelly fine sandy loam.	SM, ML, OL	A–4, A–2
			26–60	Fine sandy loam, gravelly sandy loam.	SM, ML	A–2, A–4
Windsor (WvA, WvB, WvC)	10+	48+	8–60	Loamy sand, sand	SM, SP	A–2, A–3
Woodbridge (WxA, WxB, WxC, WyA, WyB, WyC, WzA, WzC).	5+	15–20	8–22	Fine sandy loam, gravelly fine sandy loam.	SM	A–4, A–2
			22–60	Gravelly sandy loam, gravelly fine sandy loam.	SM	A–2, A–4

[1] Estimates are based on AASHO Designation T 99–57, Method A (*1*), in which only the material passing the No. 4 sieve is used.
[2] For a short time the water table may be perched at a depth of less than 48 inches, especially in lower lying areas.
[3] Subject to flooding.

of the soils—Continued

Percentage passing sieve—					Permeability	Available moisture capacity	Optimum moisture content for compaction [1]	Maximum dry density [1]	Reaction
3-inch	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)					
					Inches per hour	*Inches per inch of soil*	*Percent*	*Lbs. per cu. ft.*	*pH*
----------	95–100	90–100	85–100	60–90	0. 63–2. 0	0. 18–0. 23	10–20	90–120	5. 6–7. 3
----------	95–100	85–100	40–90	10–35	2. 0–20. 0	0. 04–0. 08	12–20	90–110	5. 1–5. 5
95–100	45–70	35–65	10–40	3–20	>20. 0	0. 04–0. 08	9–12	110–135	5. 1–5. 5
80 100	70–100	65–90	40–70	20–40	2. 0–6. 3	0. 08–0. 12	10–13	115–120	4. 5–5. 5
90–100	90–100	85–95	60–90	55–70	0. 63–2. 0	0. 17–0. 23	10–20	110–120	5. 6–6. 5
85–100	75–95	70–90	60–85	40–65	<0. 20	0. 12–0. 16	10–15	120–130	6. 6–8. 4
95–100	85–100	75–95	35–50	10–35	2. 0–6. 3	0. 12–0. 16	10–15	100–115	5. 1–6. 0
80–95	45–70	35–65	10–40	3–20	>20. 0	0. 04–0. 08	9–12	120–135	5. 1–6. 0
----------	95–100	90–100	30–90	5–30	2. 0–20. 0	0. 08–0. 12	10–15	105–110	4. 5–5. 5
95–100	45–70	35–65	10–40	3–20	>20. 0	0. 04–0. 08	9–12	120–135	5. 1–5. 5
85–100	75–85	70–90	50–60	20–40	0. 63 6. 3	0. 15–0. 20	9–18	105–115	5. 1–5. 5
85–95	60–80	50–75	40–65	15–30	2. 0–6. 3	0. 12–0. 16	12–20	105–125	5. 6–6. 0
85–100	45–100	35–90	10–60	3–35	>6. 3	0. 04–0. 16	6–15	100–135	(5)
95–100	90–100	85–100	60–80	55–70	0. 63–2. 0	0. 20–0. 24	15–19	100–110	5. 1–5. 5
75–100	40–80	35–70	10–40	3–20	>20. 0	0. 04–0. 08	9–15	110–135	5. 1–6. 0
95–100	90–100	80–100	35–50	10–35	2. 0–6. 3	0. 12–0. 16	13–17	95–120	5. 1–5. 5
75–100	40–80	35–70	10–40	2–20	>20. 0	0. 08–0. 12	10–17	105–125	5. 1–5. 5
----------	95–100	90–100	70–90	5–30	6. 3–20. 0	0. 04–0. 08	9–15	105–115	5. 6–7. 8
90–100	80–100	75–95	70–90	35–60	0. 63–2. 0	0. 18–0. 22	10–35	90–125	5. 6–6. 5
85–95	75–95	70–95	65–90	30–60	0. 20–2. 0	0. 12–0. 16	8–15	120–135	6. 1–6. 5
----------	95–100	90–100	80–95	3–30	6. 3–20. 0	0. 04–0. 08	10–18	105–120	5. 1–6. 0
90–100	65–95	60–90	45–75	25–45	0. 63–6. 3	0. 18–0. 22	10–18	110–120	5. 1–6. 0
85–95	60–90	50–80	35–65	15–35	<0. 20	0. 16–0. 20	8–12	120–130	5. 1–6. 0

[4] Excess water drains readily into cracks and crevices in the underlying bedrock. The seasonal high water table is in these cracks and crevices.

[5] Variable.

TABLE 4.—*Interpretations of*

[Interpretations are not given in this table for Borrow and fill land, coarse material (Bk); Borrow and

Soil series and map symbols	Estimated suitability as a source of—		
	Topsoil	Sand and gravel	Road fill [1]
Alluvial land (Am)	Good to fair; sloping areas are erodible.	Poor; in places contains excessive fines.	Poor; unstable at any moisture content.
Amenia (AnA, AnB, AnC, AoB, AoC, ApC).	Fair; in places contains excessive coarse fragments.	Not suitable; excessive fines	Poor; may be unstable
Au Gres (Au)	Poor; texture too coarse	Good for sand; high water table hinders excavation; in places contains poorly graded sand.	Fair; high water table hinders excavation; surface layer unsuitable.
Belgrade (BaA, BaB)	Good; sloping areas are erodible.	Not suitable; excessive fines	Poor; may be unstable
Bernardston (BqB, BqC, BuB, BuC, BwC, BwD).	Good; in places contains excessive coarse fragments.	Not suitable; excessive fines	Poor; may be unstable
Birdsall (Bz)	Fair; may be cloddy	Not suitable; excessive fines	Poor; may be unstable; high water table hinders excavation.
Branford (BoB, BoC)	Good; sloping areas are erodible.	Poor in surface layer and subsoil, excessive fines; good in substratum, contains poorly graded sand or gravel in some places.	Good to fair in some places; contains poorly sorted sand or gravel.
Charlton (CaA, CaB, CaB2, CaC, CaC2, CaD, CaE, ChB, ChC, ChD, CrC, CrD).	Fair; in places contains excessive coarse fragments.	Poor; in places contains excessive fines.	Good to fair; materials containing excessive fines may be unstable at a high moisture content.
Copake (CwA, CwB, CwC)	Fair; in places contains excessive coarse fragments.	Good; in places contains poorly graded sand or gravel.	Good to fair; in some places contains poorly sorted sand or gravel.
Deerfield (DeA)	Poor; texture too coarse	Good for sand; seasonal high water table may hinder excavation; in places contains poorly graded sand.	Good to fair; in some places contains poorly sorted sand; high water table may hinder excavation.
Dover (DoA, DoB, DoC, DoD, DvB, DvC).	Fair; in places contains excessive coarse fragments.	Poor; may in places contain excessive fines.	Good to fair; materials containing excessive fines may be unstable at a high moisture content.
Eel (Ee)	Good	Not suitable; excessive fines	Not suitable; unstable at any moisture content.
Enfield (EsA, EsB, EsC)	Good; sloping areas are erodible.	Poor in surface layer and subsoil, contains excessive fines; good in substratum, contains poorly graded sand or gravel in some places.	Good to fair; in some places contains poorly sorted sand or gravel.

See footnotes at end of table.

engineering properties of soils

fill land, loamy material (Bl); Made land (Ma); and Muck, shallow (Pm)]

Soil features affecting—				
Highway location	Grading in winter	Construction of farm ponds: Reservoir area	Construction of farm ponds: Embankments	Artificial drainage
Subject to flooding; material may be unstable.	High water table in winter; subject to flooding.	Subject to flooding; permeability variable.	Soil features variable	Subject to flooding; ponding in some areas.
Seasonal high water table; subject to seepage and slides along cuts.	High water table in winter; difficult to compact.	Slow to very slow permeability; seasonal high water table.	Good to poor stability and compaction; in places contains numerous stones; erodible in sloping areas.	Slow to very slow permeability; seasonal high water table.
High water table; surface ponding; material unstable unless confined.	High water table in winter; very poor surface drainage.	Seasonal high water table; permeability may be rapid and seepage excessive when water table is low.	Good to poor stability; good to fair compaction; may be highly pervious.	Ponding in some areas; wet areas commonly lower than available outlets.
Erodible on embankments; seasonal high water table.	High water table in winter; difficult to compact.	Seasonal high water table; moderate permeability and seepage.	Good to poor stability and compaction; erodible in sloping areas.	Moderate permeability; seasonal high water table.
Erodible on embankments; subject to seepage and slides along cuts.	Difficult to compact; some areas are steep and very stony.	Slow to very slow permeability below hardpan; some areas are steep.	Fair to poor stability and compaction; in places contains numerous channery fragments.	Natural drainage adequate.
High water table; surface ponding.	High water table in winter; very poor surface drainage.	Seasonal high water table; moderate permeability.	Fair to poor stability and compaction; moderately permeable when compacted.	Ponding in some areas; moderate permeability; wet areas commonly lower than available outlets.
Surface layer and subsoil unstable.	Material in surface layer and subsoil is difficult to compact; sand and gravel of substratum are favorable.	Pervious material; excessive seepage.	Good to fair stability and compaction; slightly pervious in places; contains numerous cobblestones.	Natural drainage adequate.
In places contains numerous boulders.	Some areas are steep and very stony.	Moderately rapid permeability and seepage; some areas are steep.	Fair stability and compaction; moderately pervious; in places contains numerous stones and cobblestones.	Natural drainage adequate.
Surface layer and subsoil may be unstable.	Material in surface layer and subsoil may be difficult to compact; sand and gravel of substratum are favorable.	Pervious material; excessive seepage.	Good to fair stability and compaction; highly pervious; in places contains numerous stones and cobblestones.	Natural drainage adequate.
Unstable unless confined	High water table in winter; commonly difficult to compact.	Seasonal high water table; moderately rapid permeability and seepage when water table is low.	Fair to poor stability; fair to good compaction; moderately pervious.	Seasonal high water table.
In places contains numerous boulders.	Some areas are steep; material in surface layer and subsoil may be difficult to compact.	Moderately rapid permeability and seepage; some areas are steep.	Fair stability and compaction; moderately pervious; in places contains numerous stones and cobblestones.	Natural drainage adequate.
Subject to flooding; unstable material.	High water table in winter; difficult to compact; subject to flooding.	Seasonal high water table; moderate permeability; subject to flooding.	Fair to poor stability and compaction; susceptible to piping.	Subject to flooding; moderate permeability; seasonal high water table.
Surface layer and subsoil unstable.	Material in surface layer and subsoil is difficult to compact; sand and gravel of substratum are favorable.	Pervious material; excessive seepage.	Poor stability and compaction in material above substratum; substratum material is highly pervious; in places contains numerous cobblestones.	Natural drainage adequate.

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TABLE 4.—*Interpretations of engineering*

Soil series and map symbols	Estimated suitability as a source of—		
	Topsoil	Sand and gravel	Road fill [1]
Farmington (FaC, FaE, FmC, FmE)	Not suitable; too many coarse fragments.	Not suitable; excessive fines.	Not suitable; limited volume of material; may be unstable.
Fredon (Fr)	Fair	Not suitable; excessive fines; high water table.	Poor; may be unstable; high water table hinders excavation.
Genesee (Gf)	Good	Not suitable; excessive fines.	Not suitable; unstable at any moisture content.
Gloucester (GaB, GaC, GaD, GbB, GbC, GbD, GeC, GeE).	Poor; texture too coarse; in places contains excessive coarse fragments.	Fair in substratum; in places contains some fines.	Good
Granby (Gn)	Poor; texture too coarse	Good for sand; high water table may hinder excavation; in some places contains poorly graded sand.	Good to fair; water table may hinder excavation.
Groton (GrA, GrC)	Poor; texture too coarse; in places contains excessive coarse fragments.	Good; in some places contains poorly graded sand and gravel.	Good
Hartland (HbA, HbB, HbC)	Good; sloping areas are erodible.	Not suitable; excessive fines.	Fair to poor; may be unstable.
Hero (HeA, HeB)	Fair; may be somewhat cloddy.	Poor in surface layer and subsoil, excessive fines; fair in substratum, high water table may hinder excavation; in some places contains poorly graded sand and gravel.	Fair; high water table may hinder excavation.
Hinckley (HkA, HkC, HmA, HmC)	Poor; texture too coarse; in places contains excessive coarse fragments.	Good; in some places contains poorly graded sand and gravel.	Good
Hollis (HoC, HrC, HrE, HxC, HxE).	Fair; in places contains excessive coarse fragments.	Not suitable; excessive fines; limited volume of material.	Not suitable; limited volume of material may be unstable.
Holyoke (HyC, HzE)	Fair; in places contains excessive coarse fragments.	Not suitable; excessive fines; limited volume of material.	Not suitable; limited volume of material; may be unstable.
Kendaia (Ka, Ke) (For interpretations of Lyons soil in mapping unit Ke, refer to the Lyons series.)	Fair; somewhat cloddy; in places contains excessive fragments.	Not suitable; excessive fines.	Poor; may be unstable; high water table hinders excavation.
Leicester (Lc, Le, Lg) (For interpretations of Ridgebury and Whitman soils in mapping unit Lg, refer to their respective series.)	Poor; in places contains excessive coarse fragments.	Not suitable; excessive fines.	Fair to poor; high water table may hinder excavation.

See footnotes at end of table.

properties of soils—Continued

Soil features affecting—				
Highway location	Grading in winter	Construction of farm ponds		Artificial drainage
		Reservoir area	Embankments	
Shallow to bedrock	Shallow to bedrock; some areas are steep and extremely rocky.	Shallow to bedrock; seepage may be excessive.	Limited volume of material; in places contains numerous stones and cobblestones.	Natural drainage adequate.
High water table	High water table in winter; poor surface drainage; difficult to compact.	Seasonal high water table; permeability and seepage moderately rapid when water table is low.	Fair to poor stability and compaction; susceptible to piping.	Moderate permeability.
Subject to flooding; unstable material.	Difficult to compact; subject to flooding.	Subject to flooding; moderate permeability.	Fair to poor stability and compaction; susceptible to piping.	Natural drainage adequate; subject to flooding.
In places contains numerous boulders.	Soil features favorable	Pervious material; excessive seepage; some areas are steep.	Fair stability and compaction; moderately pervious; in places contains numerous stones and cobblestones.	Natural drainage adequate.
High water table; surface ponding; material unstable unless confined.	High water table in winter; very poor surface drainage.	Seasonal high water table; moderately rapid permeability and seepage when water table is low.	Good to fair stability and compaction; moderately pervious.	Surface ponding in some areas; wet areas commonly lower than available outlets.
Soil features favorable	Soil features favorable	Pervious material; excessive seepage.	Good to fair stability and compaction; highly pervious; in places contains numerous stones and cobblestones.	Natural drainage adequate.
Unstable material; erodible on embankments.	Difficult to compact	Moderate permeability and seepage.	Good to poor stability and compaction; erodible in sloping areas.	Natural drainage adequate.
High water table; material may be unstable; erodible on embankments.	High water table in winter; material in surface layer and subsoil may be difficult to compact; sand and gravel of substratum are favorable.	Seasonal high water table; sand and gravel of substratum pervious; excessive seepage.	Fair to poor stability and compaction in surface layer and subsoil; fair to good stability in gravelly substratum; sand and gravel pervious.	Seasonal high water table; moderate to rapid permeability.
Soil features favorable	Soil features favorable	Pervious material; excessive seepage.	Good to fair stability and compaction; highly pervious; in places contains numerous stones and cobblestones.	Natural drainage adequate.
Shallow to bedrock	Shallow to bedrock; some areas are steep and extremely stony.	Shallow to bedrock; seepage may be excessive.	Limited volume of material; in places contains numerous stones and cobblestones.	Natural drainage adequate.
Shallow to bedrock	Shallow to bedrock; some areas are steep and extremely stony.	Shallow to bedrock; seepage may be excessive.	Limited volume of material; poor stability; erodible in steep areas.	Natural drainage adequate.
High water table; seepage along cuts; material may be unstable; erodible on embankments.	High water table in winter; difficult to compact.	Seasonal high water table; slow to very slow permeability.	Good to poor stability and compaction; in places contains numerous stones and cobblestones; erodible in steep areas.	Slow to very slow permeability below depth of 24 inches.
Seasonal high water table	High water table in winter.	Seasonal high water table; moderately rapid permeability and seepage when water table is low.	Fair stability and compaction; moderately pervious; in places contains numerous stones and cobblestones.	Moderate to moderately rapid permeability.

TABLE 4.—*Interpretations of engineering*

Soil series and map symbols	Estimated suitability as a source of—		
	Topsoil	Sand and gravel	Road fill [1]
Limerick (Lm)	Fair; somewhat cloddy	Not suitable; excessive fines	Poor; may be unstable
Lyons (Ly)	Poor; somewhat cloddy	Not suitable; excessive fines	Poor; may be unstable; high water table may hinder excavation.
Merrimac (MyA, MyB, MyC)	Fair; texture moderately coarse.	Good; in some places contains poorly graded sand and gravel.	Good to fair; in some places contains poorly sorted sand or gravel.
Ondawa (On)	Fair; texture moderately coarse.	Poor above depth of 32 inches; fair to good below 32 inches.	Good to fair; upper 32 inches of soil may be unstable.
Paxton (PbA, PbB, PbB2, PbC, PbC2, PbD, PbD2, PbE, PdB, PdC, PdD, PeA, PeC, PeD).	Fair; in places contains excessive coarse fragments.	Poor; in places contains excessive fines.	Fair to poor; in places contains excessive stones.
Peat and Muck (Pk)	Variable; suitability depends on stage of decomposition.	Not suitable; high organic-matter content.	Not suitable; unstable
Podunk (Po)	Fair; texture moderately coarse.	Poor above depth of 32 inches; fair below 32 inches; high water table may hinder excavation.	Good to fair; high water table may hinder excavation; upper 32 inches of soil may be unstable.
Raynham (Rc)	Fair; somewhat cloddy	Not suitable; excessive fines	Fair to poor; may be unstable; high water table may hinder excavation.
Ridgebury (Rd, Rg)	Poor; in places contains excessive stones.	Poor; in places contains excessive fines.	Fair to poor; high water table may hinder excavation.
Riverwash (Re)	Not suitable; texture variable; excavation difficult.	Fair to poor; variable texture.	Fair to poor; high water table may hinder excavation; texture variable.
Rock land (Rh)	Not suitable; insufficient depth.	Not suitable; insufficient depth.	Not suitable; limited volume of material.
Rumney (Ru)	Fair; texture moderately coarse.	Poor above depth of 32 inches; fair below 32 inches.	Good to fair; high water table may hinder excavation.
Saco (Sb)	Poor; cloddy in many places	Poor; contains excessive fines.	Poor; material generally unstable; high water table may hinder excavation.
Scarboro (Sf)	Poor; in places contains excessive coarse fragments.	Fair; high water table may hinder excavation; in places contains poorly graded sands.	Fair; high water table hinders excavation; loamy fine sand is unstable unless confined.

See footnotes at end of table.

properties of soils—Continued

Soil features affecting—				
Highway location	Grading in winter	Construction of farm ponds		Artificial drainage
		Reservoir area	Embankments	
Subject to flooding; material may be unstable; erodible on embankments.	High water table in winter; difficult to compact; subject to flooding.	Subject to flooding; seasonal high water table; moderate permeability.	Fair to poor stability and compaction; susceptible to piping.	Subject to flooding; moderate permeability.
High water table; surface ponding; material may be unstable.	High water table in winter; difficult to compact; material generally unsuitable for construction use.	Seasonal high water table; slow to very slow permeability.	Good to poor stability and compaction; high content of organic matter in surface layer.	Ponding in some areas; slow to very slow permeability.
Soil features favorable	Soil features favorable	Pervious material; excessive seepage.	Good to fair stability and compaction; highly pervious.	Natural drainage adequate.
Subject to flooding	Subject to flooding	Subject to flooding; excessive seepage in sand and gravel.	Fair stability and compaction; moderately to highly pervious.	Natural drainage adequate; subject to flooding.
Seepage and slides along cuts on lower slopes; in places contains numerous boulders.	Some areas are steep and very stony; difficult to compact in some places.	Slow to very slow permeability below hardpan; some areas are steep.	Fair stability and compaction; in places contains numerous stones and cobblestones.	Natural drainage adequate.
High water table; surface ponding; material unstable.	High water table in winter; organic materials unsuitable for construction use.	Seasonal high water table.	Very poor stability; high shrinkage.	Permeability variable; ponding in some areas; wet areas commonly lower than available outlets.
Subject to flooding	High water table in winter; subject to flooding.	Subject to flooding; seasonal high water table; moderate seepage in sand and gravel when water table is low.	Fair stability and compaction; moderately to highly pervious.	Subject to flooding; moderate to rapid permeability; seasonal high water table.
High water table; material may be unstable; erodible on embankments.	High water table in winter; difficult to compact.	Seasonal high water table; moderate permeability.	Fair to poor stability and compaction; susceptible to piping.	Moderate permeability.
High water table; seepage along cuts; material may be unstable.	High water table in winter; difficult to compact in some places.	Seasonal high water table; slow to very slow permeability below hardpan.	Fair to poor stability and compaction; in places contains numerous stones and cobblestones.	Slow to very slow permeability in hardpan.
Subject to flooding	Generally flooded in winter.	Subject to flooding	Soil material variable	Not applicable.
Shallow to bedrock	Steep slopes and extremely rocky; bedrock very near surface.	Shallow to bedrock; seepage may be excessive.	Limited volume of material; in places contains numerous stones and cobblestones.	Natural drainage adequate.
Subject to flooding	High water table in winter; subject to flooding.	Subject to flooding; seasonal high water table; moderate seepage in sand and gravel when water table is low.	Fair stability and compaction; moderately to highly pervious.	Subject to flooding; moderate to rapid permeability.
Subject to flooding; high water table.	High water table in winter; very poor surface drainage; subject to flooding.	Subject to flooding; seasonal high water table; moderate permeability.	Poor stability and compaction; susceptible to piping.	Moderate permeability; ponding in some areas; wet areas commonly lower than available outlets.
High water table; surface ponding; material may be unstable unless confined.	High water table in winter; very poor surface drainage.	Seasonal high water table; moderate to very rapid permeability and seepage when water table is low.	Generally good to fair stability and compaction, but loamy fine sand may be unstable in some places.	Moderate to very rapid permeability; ponding in some areas; wet areas commonly lower than available outlets.

TABLE 4.—*Interpretations of engineering*

Soil series and map symbols	Estimated suitability as a source of—		
	Topsoil	Sand and gravel	Road fill [1]
Shapleigh (SkC, SkE, SmC, SmE)	Not suitable; contains excessive coarse fragments.	Not suitable; limited volume of material.	Not suitable; limited volume of material.
Stockbridge (SnA, SnB, SnB2, SnC, SnC2, SnD2, SpB, SpC, SpD, SrC, SrD).	Fair; in places contains excessive coarse fragments.	Not suitable; contains excessive fines.	Poor; may be unstable
Sudbury (mapped only with Tisbury soil).	Fair; texture moderately coarse.	Good; in some places contains poorly graded sand and gravel.	Good to fair; high water table may hinder excavation.
Suncook (St)	Poor; texture too coarse	Fair for sand; in places contains poorly graded sand.	Good to fair; may be unstable unless confined.
Sutton (SvA, SvB, SwA, SwB, SxA, SxC).	Fair; in places contains excessive coarse fragments.	Poor; in places contains excessive fines.	Fair; high water table may hinder excavation.
Terrace escarpments (Tg)	Poor; texture too coarse	Good to fair; in places contains poorly graded sand and gravel.	Good to fair; in some places contains poorly sorted sand or gravel.
Tisbury (TwA, TwB) (For interpretations of Sudbury soil in mapping units TwA and TwB, refer to the Sudbury series.)	Good; sloping areas are erodible.	Poor in surface layer and subsoil, contains excessive fines; good in substratum, in places contains poorly graded sand or gravel.	Good to fair; in some places contains poorly sorted sand or gravel.
Walpole (Wl) (For interpretations of the Raynham soil in mapping unit Wl, refer to the Raynham series.)	Poor; in places texture is too coarse.	Fair; in places contains excessive fines; high water table hinders excavation.	Fair to poor; high water table may hinder excavation.
Wareham (Wmx)	Not suitable; texture too coarse.	Fair for sand; in places contains poorly graded sand; high water table may hinder excavation.	Fair; high water table hinders excavation; may be unstable unless confined.
Whitman (Wp)	Poor; in places contains excessive coarse fragments.	Not suitable; contains excessive fines.	Good to fair; high water table hinders excavation; in places contains numerous boulders.
Windsor (WvA, WvB, WvC)	Poor; texture too coarse	Good for sand; in some places sand is poorly graded.	Good to fair; may be unstable unless confined.
Woodbridge (WxA, WxB, WxC, WyA, WyB, WyC, WzA, WzC).	Fair; in places contains excessive coarse fragments.	Not suitable; contains excessive fines.	Fair to poor; may be unstable; high water table hinders excavation.

[1] Suitability ratings are for soil material in the substratum, mostly below a depth of 18 to 30 inches. Generally, the material above the substratum is less suitable.

properties of soils—Continued

Soil features affecting—				
Highway location	Grading in winter	Construction of farm ponds		Artificial drainage
		Reservoir area	Embankments	
Shallow to bedrock	Shallow to bedrock; some areas are steep and extremely stony.	Shallow to bedrock; seepage may be excessive.	Limited volume of material; in places contains numerous stones and cobblestones.	Natural drainage adequate.
Material may be unstable	Commonly difficult to compact.	Slow to very slow permeability; some areas are steep.	Good to poor stability and compaction; in places contains numerous stones and cobblestones.	Natural drainage adequate.
Seasonal high water table	High water table in winter.	Seasonal high water table; excessive seepage when water table is low.	Good to fair stability and compaction; highly pervious.	Seasonal high water table; moderately rapid to very rapid permeability.
Subject to flooding	Subject to flooding	Subject to flooding: pervious material; excessive seepage.	Good to fair stability and compaction; moderately to highly pervious.	Natural drainage adequate; subject to flooding.
Seasonal high water table; in places contains numerous boulders.	High water table in winter; some areas are very stony.	Seasonal high water table; moderate seepage when water table is low.	Fair stability and compaction; in places contains numerous stones and cobblestones; moderately pervious.	Seasonal high water table; moderate to moderately rapid permeability.
Soil features favorable	Some areas are steep	Previous material; excessive seepage.	Good to fair stability; highly pervious.	Natural drainage adequate.
High water table; surface layer and subsoil may be unstable; erodible on embankments.	High water table in winter; difficult to compact.	Seasonal high water table; moderate seepage when water table is low.	Poor stability and compaction; substratum material is highly pervious; in places contains numerous stones and cobblestones.	Moderate permeability in surface layer and subsoil; very rapid permeability in substratum; seasonal high water table.
High water table	High water table in winter; poor surface drainage; commonly difficult to compact.	Seasonal high water table; excessive seepage when water table is low.	Good to fair stability and compaction; highly pervious.	Seasonal high water table; moderately rapid to rapid permeability.
High water table; surface ponding; material may be unstable unless confined.	High water table in winter.	Seasonal high water table; permeability may be rapid and seepage excessive when water table is low.	Good to poor stability and compaction; moderately to highly pervious.	Rapid permeability; ponding in some areas; wet areas commonly lower than available outlets.
High water table; surface ponding; material may unstable.	High water table in winter; very poor surface drainage; commonly difficult to compact.	Seasonal high water table; permeability moderately slow to moderate.	Fair to poor stability and compaction; in places contains numerous stones and cobblestones.	Moderately slow to moderate permeability; ponding in some areas.
Material may be unstable unless confined.	Difficult to compact in some places.	Pervious material; excessive seepage.	Fair to poor stability; fair to good compaction; moderately to highly pervious.	Natural drainage adequate.
Seasonal high water table; subject to seepage and slides along cuts.	Some areas are very stony; difficult to compact in some places.	Slow to very slow permeability below hardpan; seasonal high water table.	Fair stability and compaction; moderately pervious; in places contains numerous stones and cobblestones.	Slow to very slow permeability in hardpan.

clay soil having low strength when wet. In each group the relative engineering value of the soil material is indicated by a group index number. Group indexes range from 0 for the best material to 20 for the poorest. The group index number is shown in parentheses following the soil group symbol (in this soil survey, the group index number is shown only in table 2).

Some engineers prefer to use the Unified Soil Classification System (*22*). In this system, soil material is divided into 15 classes: 8 classes are for coarse-grained material, 6 for fine-grained material, and 1 for highly organic material. Mechanical analyses are used to determine the GW, GP, SW, and SP classes of material; mechanical analyses, liquid limit, and plasticity index are used to determine GM, GC, SM, SC, and fine-grained material.

Engineering test data

Samples from nine profiles representing three soil series in Litchfield County were tested by the Connecticut State Highway Department according to standard AASHO procedures. One profile of each series is modal, that is, near the central concept of the series; the other two are from soils having profiles within the range established for the series. The results of these tests are given in table 2.

Generally, the engineering classifications of soils are based on mechanical analyses and on tests of the liquid and plastic limits. In Litchfield County, however, all samples tested were determined to be nonplastic. Consequently, the classifications shown in table 2 are based solely on mechanical analyses, which were made by the combined sieve and hydrometer methods.

Table 2 also gives moisture-density compaction data for the tested soils. If a soil material is compacted at a successively higher moisture content, assuming that the compactive effort remains constant, its density will increase until the optimum moisture content is reached. After that, the density decreases with increase in moisture content. The highest dry density obtained in the compaction test is called the maximum dry density. Moisture-density data are important in earthwork, for as a rule, the greatest stability is obtained if the soil is compacted to about the maximum density when it is at approximately the optimum moisture content. The surface layer (Ap horizon) of several profiles sampled was determined unsuitable for compaction because of the high organic-matter content.

Estimated engineering properties

Table 3 shows some estimated soil properties that are important in engineering, and it gives estimated AASHO and Unified classifications for the soils. The textural terms used to describe the soil material are those used by the U.S. Department of Agriculture. For each soil series, the uppermost 8 inches of the profile is excluded because this layer is seldom used as construction material except in final grading and landscaping.

The depth to bedrock is difficult to estimate for some soils because the rock has an undulating surface. Unless otherwise shown, bedrock generally occurs below a depth of 5 feet in soils formed in glacial till and below a depth of 10 feet in soils formed in stratified material laid down by water.

The depth to a seasonal high water table is the depth to a normal water table or to a temporary water table that occurs over a slowly permeable layer. A temporary water table rises and falls rapidly and is of short duration. It reaches its highest level early in spring and then drops 3 to 4 feet by fall. The persistence of a temporary water table depends on the frequency and intensity of rainfall and on the length and degree of slope. Such a water table remains longer on lower slopes than on middle and upper slopes.

Permeability is expressed as inches of water per hour and is the average rate for the part of the soil under consideration. An individual soil horizon may have a permeability rate that differs considerably from that of the other horizons. This is especially true in cultivated soils where a plowpan or another mechanically compacted layer has a permeability rate much lower than that of the overlying plow layer or the underlying soil material. Variations within the substratum are commonly caused by stratification.

The estimated permeability rates in table 3 represent the vertical drainage when the soil is saturated. Soil permeability rates for the design of sewage disposal systems are generally obtained from field tests. Additional information on permeability is in the subsection "Community Development."

The available moisture capacity, expressed as inches of water per inch of soil, is approximately the moisture held in the range between field capacity and the wilting point. It is related to the textural class designated for the soil series, and if more than one textural class has been designated, the range has been expanded to include all of the classes. Available moisture capacity generally is given for the entire soil profile from the surface to the maximum depth shown.

Optimum moisture is the moisture content at which the soil can be compacted to maximum dry density.

Maximum dry density is the greatest amount of soil, by weight, that can be compacted into a given unit of volume, under controlled conditions and by standard procedures.

Reaction refers to the acidity or alkalinity of the soil, expressed in terms of pH. A pH of 7.0 is neutral; values of less than 7.0 indicate acidity, and values of more than 7.0 indicate alkalinity.

Engineering interpretations

Table 4 rates the soils of Litchfield County according to their suitability as sources of topsoil, sand and gravel, and road fill. It also lists soil features that affect different kinds of engineering work. The features shown are those affecting the location of highways, grading in winter, construction of farm ponds, and drainage systems. The interpretations are based on information in tables 2 and 3 and on the experience of engineers in the county.

During most construction, the topsoil is stripped off and sold or later replaced. In some areas that formerly were farmed or wooded, the topsoil is too thin for stripping. Good topsoil is free of stones, has a medium texture, and contains a fair amount of organic matter.

Stones limit the usefulness of many soils as topsoil, and even if the surface stones are removed, some soils are of only limited use because they contain many small fragments. Texture is the main feature affecting the quality of topsoil, for it is important in determining the available water capacity. The Belgrade, Branford, Eel, Enfield, Genesee, Hartland, and Tisbury soils are good sources of topsoil, and so are the nonstony Bernardston and Stockbridge soils. The moderately coarse textured and coarse textured Copake, Merrimac, Ondawa, and Hinckley soils are only fair to poor sources because they have low available water capacity and are droughty. Topsoil taken from almost any soil is erodible if it is placed in sloping to steep areas and left unprotected.

Soils that are poorly drained or very poorly drained generally have a dark-colored surface layer rich in organic matter, but they are not necessarily good sources of topsoil. Color is not a reliable indicator of the amount of organic matter a soil contains.

Soils underlain by deposits of water-stratified materials are the most common source of sand and gravel. These include the Branford, Copake, Hinckley, Merrimac, and Windsor soils. Although the soils on uplands generally are a poor source, the Gloucester soils are fair because they developed on coarse-textured gravelly till.

The suitability of the soils as a source of material for road fill (subgrade) is indicated by the Unified and AASHO classifications (see table 3). Soils rated GW, GP, GM, or SW in the Unified system and A–1 or A–2 (low in fines) in the AASHO system are considered a good source of material. Those classified SP, SM, SC, or ML and A–2 (high in fines), A–3, or A–4 are a fair to poor source. Soils rated ML, CL, or OH and A–6 or A–7 are a poor source.

Poorly drained and very poorly drained soils vary in their suitability for road subgrade. Although their textural properties may be satisfactory, a permanent high water table may interfere with their excavation.

Soils unsuitable for road fill are Peat and Muck, soils having a high organic-matter content, and those containing stumps and brush debris.

The soils most suitable for grading in winter are loamy sand, sandy loam, and gravelly sandy loam. Fair to poor for winter grading are fine sandy loam, very fine sandy loam, and areas of silt loam that is almost fine sandy loam. Most areas of silt loam, as well as all poorly drained and very poorly drained soils, are unsuitable for winter grading because they usually contain a large amount of water, which may be frozen at that time of year.

Features that are unfavorable in locating a road or highway are ponding, flooding, seepage, a high water table, slides and erosion along unstable road cuts, the presence of peat or muck, and bedrock near the soil surface.

The choice of a site for a pond or reservoir depends largely on the amount or rate of seepage that can be expected, particularly at the bottom of the reservoir, and the anticipated stability and permeability of embankments. Soils most suitable for a reservoir area have a permanent high water table and are underlain by a slowly permeable layer. Some poorly drained and very poorly drained soils are underlain by coarse-textured material and have a water table that fluctuates considerably from one season to another. These soils are less suitable for farm ponds because of seepage when the water table is low. Seepage losses, however, can be minimized through proper excavation and compaction or by lining the surface with impervious material.

The embankments for farm ponds should be impervious and have adequate strength and stability. Coarse textured and moderately coarse textured soils have adequate strength and stability but permit moderate to rapid seepage. On the other hand, medium-textured soils having a high content of silt and clay lack stability but allow only a small amount of seepage.

Embankments can be made impervious by proper mixing and compaction of the soil material, by lining them with an impervious face, or by sealing them. Similarly, soil material that is unstable can be improved by mixing in and compacting coarser textured material. If the steep side slopes of embankments are left exposed, the soil material is likely to be eroded.

Drainage systems are established mainly to lower the water table and to create a more favorable balance between air and moisture in the soil. Soils that have impeded drainage and are underlain by friable, coarse-textured material are not difficult to drain by conventional tile systems. Soils underlain by a slowly permeable pan are somewhat difficult to drain. For these soils, open intercepting ditches are generally more effective than tile drains.

Draining Peat and Muck is very uncommon in the county, but it can be done by using open ditches. Tile lines are less effective. A tile system may be feasible following open ditching after the organic materials have settled or adjusted to the lowering of the water table. Suitable outlets are generally difficult to find for draining Peat and Muck.

Community Development

Litchfield County is in the Western Highlands, a relatively isolated part of Connecticut, and until recent years its population has grown more slowly than that of counties to the east and south. Presently, however, industrial expansion in Torrington, Winsted, Thomaston, New Milford, and Waterbury (New Haven County) is bringing an increase in the residential and commercial uses of land in the towns of Watertown, Plymouth, Woodbury, and New Milford.

In this subsection of the survey, the properties are related specifically to community development. The information can be used by many persons and agencies concerned with such development. It is useful to those who guide regional planning and to town planning and zoning commissions that guide local planning. Regional planners are interested in soils from a broad viewpoint. Their main considerations are soil associations, landforms, and relief. The town planning and zoning commissions, as well as health officials, are interested in potential business, residential, industrial, and recreation sites, in lot subdivision, and in the selection of school sites. Hence, they require more specific information about soils, and they deal directly with individual soils or groups of soils. Tax assessors, building and loan officials,

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and real estate appraisers also can use the information about soils when they determine land values.

The estimates of soil properties and limitations discussed in this subsection have evolved from field experience and from laboratory tests. *These interpretations are best used as a guide for planning more detailed investigation. They cannot replace onsite investigation of specific tracts of land.* The interpretations are based on soil features and reflect present economic factors. They may be subject to change as additional knowledge and experience are gained.

The effects of soils on community development

To assist persons and agencies concerned with developing communities, the soils of the county have been placed in 13 urban groups. Each group is made up of soils that have many properties in common and have similar limitations that affect various uses in areas of expanding business, housing, and recreation. These groups are described later in this subsection.

The uses considered are onsite sewage disposal systems, homes with basements, homesite landscaping, streets and parking lots, athletic fields, and sanitary land fills.

Among the most important soil features are depth, texture, structure, permeability, available moisture capacity, slope, stoniness, size and spacing of rock outcrops, and frequency of flooding.

The degree of limitation is rated slight, moderate, severe, or very severe. A rating of *slight* indicates that any limitation affecting use of the soil is relatively unimportant and can be overcome in a short time or at little expense. A rating of *moderate* shows that moderate limitations are recognized but can be overcome or corrected at average to somewhat higher than average expense. A rating of *severe* indicates that use of the soil is seriously limited by hazards or restrictions that require extensive and costly measures to overcome. A rating of *very severe* means that soil limitations are extremely difficult or costly to overcome or that soil features are so unfavorable that use is scarcely feasible.

A rating of severe for a particular use does not imply that a soil so rated cannot be put to that use. Some potential homeowners may consider pleasant surroundings and distance to work of more immediate importance than a septic tank that functions well or a basement that is always dry. To the town planning, zoning, and health officials, however, septic tank performance and natural drainage are important factors to consider in guiding local development and in guarding public health.

Onsite sewage disposal systems.—In areas without sewers, waste is commonly disposed of by a septic tank or cesspool. Many soils have characteristics that prohibit or seriously limit the use of such disposal systems. Several kinds of such systems have been developed, and onsite investigation is necessary to determine which is best. The kind most commonly used is the septic tank.

The use of septic tanks for disposing of sewage effluent is discussed in three publications that are available, "Private Subsurface Sewage Disposal" (*3*), "Percolation Testing for Septic Tank Drainage" (*10*), and "Manual of Septic Tank Practice" (*21*).

The suitability of soils for septic tanks depends, to a large extent, on the effectiveness of the soil material in permitting percolation of effluent. The following information applies to the Amenia, Bernardston, Paxton, Stockbridge, and Woodbridge soils, all of which have a slowly permeable layer within 30 inches of the surface. In these soils the percolation of water is restricted by the compact layer, and water is likely to move laterally over the restricting layer. The rate of lateral flow depends mainly on slope. In level areas the water moves very slowly and often stagnates. In steeper areas it moves more rapidly, generally along preferred subsurface channels. Commonly it seeps out along lower slopes, particularly in places where the compact layer is near the surface. The percolation rate within the compact layer seldom exceeds 1 inch per hour, and the mean percolation rate is less than 0.1 inch per hour. Above the compact layer the percolation rate is generally greater and in many places exceeds 2 inches per hour.

Tile lines of septic tank drainage fields placed in soils that have a compact layer are subject to more frequent failure than those placed in soils without such a layer. Most failures are the result of slow percolation in the slowly permeable layer. Tile lines placed above a slowly permeable layer may work satisfactorily in summer, but from late in fall to late in spring the probability of failure increases if a perched water table is formed. The depth to the perched water table or zone of soil saturation is critical according to the depth to the base of the leaching field. If the water table rises above the tile line and floods the drainage field, a backup occurs in the house, and this condition can last for several hours or even weeks.

Leaching cesspools generally fail in soils that have a deep, compact, slowly permeable layer. In the Bernardston, Paxton, and Woodbridge soils, for example, the compact, slowly permeable till extends to an appreciable depth.

In the discussion of urban groups, the soil limitations that affect the disposal of septic tank effluent are based on permeability; the depth to a water table, a compact layer, or bedrock; slope; the degree of stoniness; the number of rock outcrops; and the frequency of flooding.

Homes with basements.—In evaluating soils as sites for homes with basements, the limitations indicate adverse features that affect excavations for foundations, the stability of footings, and the installation and performance of footing drains. Soils are limited by bedrock, large boulders, a high organic-matter content, sloughing of sand and gravel, a high water table, lateral movement of water over a compact layer, surface ponding, and flooding.

Homesite landscaping.—Landscaping includes final grading of the site, planting trees and shrubs, establishing a lawn, and maintaining the landscaped area. Among the soil properties that affect landscaping are texture, available moisture capacity, erosion hazard, depth to water table, internal drainage, slope, surface stoniness, outcrops of bedrock, depth to bedrock, and the risk of flooding.

Streets and parking lots.—The soil properties evaluated for streets and parking lots affect the selection of rights-of-way for secondary streets in areas developed for homes, small business, and light industry. The interpreta-

tions do not apply to primary road construction in which large cuts and fills are commonly required. Use of soils for streets and parking lots is influenced by natural drainage, slope, stoniness, outcrops of rock, depth to bedrock, and hazard of flooding.

Athletic fields.—These are level or nearly level fields used mainly for various sports and other forms of outdoor recreation. Considered in rating the soils are internal drainage, depth to water table, depth to bedrock, surface stoniness, size and distribution of rock outcrops, soil texture, and hazard of flooding.

Sanitary land fills.—In considering the use of soils for sanitary land fills, the important features are the quality of the soil as a site for land fill and the suitability of the soil as fill material. The interpretations are for unimproved sites, not for land fills in former gravel pits and areas stripped for fill.

Generally, the method of land fill is determined by the characteristics of the site. Trench fills are suitable in deep, level or nearly level, stone-free soils that have good drainage and a low water table. Sidehill fills can be used if the soils are steep or stony, if rock outcrops are numerous, or if the water table is high. In these areas, however, cover material is commonly insufficient. Among the soil features that determine whether a soil can be used for sanitary land fills are internal drainage, depth to water table, slope, number and spacing of rock outcrops, depth to bedrock, and the risk of flooding. Features used in evaluating soils as a source of cover material are texture and stoniness.

Urban groups of soils

Discussed in the following pages are the urban groups of the county. The names of soil series represented are mentioned in the description of each urban group, but this does not mean that all the soils of a given series appear in the group. To find the names of all the soils in any given urban group, refer to the "Guide to Mapping Units" at the back of this survey.

Within the mapping units in each urban group, there may be inclusions of other soils and, therefore, local variations in soil properties that require onsite examination. The significant inclusions are mentioned in the description of each mapping unit in the section "Descriptions of the Soils."

Borrow and fill land, coarse material; Borrow and fill land, loamy material; and Made land have not been placed in urban groups. These land types vary so much from one location to another that special onsite investigations are necessary to determine their suitability for specific uses.

URBAN GROUP 1

This group is made up of well-drained to excessively drained soils of the Branford, Copake, Enfield, Groton, Hartland, Hinckley, Merrimac, and Windsor series. All the soils but the Hartland formed on water-laid terraces consisting of stratified sand or sand and gravel. The Hartland soils formed in deep silt and very fine sand. Texture of the surface layer ranges from loam and silt loam to gravelly loamy sand; that of the underlying material is mostly loamy sand or sand that contains gravel.

These soils have few limitations that affect use for community development. Slopes are dominantly less than 8 percent, though the Groton and Hinckley soils have slopes ranging to 15 percent.

Generally, septic tank performance is good. The percolation rate is high and seldom falls below 2 inches per hour. Failures are rare and normally not related to soil properties, but very rapid drainage in the underlying material may result in pollution of shallow wells.

For homes with basements, excavation is not limited by bedrock or stoniness. Shoring of deep trenches may be needed to prevent cave-ins. Because internal drainage is good, basements generally are dry.

Limitations of the soils for homesite landscaping are slight to severe. Where the Enfield and Hartland soils have slopes of more than 3 percent, the risk of erosion is moderate. Although slopes need protection after seeding, lawns are easily established and maintained on the Branford, Enfield, and Hartland soils because of their high available moisture capacity. Frequent irrigation is commonly needed for lawns and shrubs on the droughty Groton, Hinckley, and Windsor soils.

The limitations for streets and parking lots and for athletic fields are slight to moderate. Land shaping is needed in some areas where slopes exceed 3 percent. For athletic fields the droughty Groton, Hinckley, and Windsor soils are poorly suited to turf-forming plants and should be covered with finer textured topsoil.

For sanitary land fills the limitations are slight to moderate for trench fills and are moderate for sidehill fills. In places the Groton and Hinckley soils are too cobbly and stony for use as cover material. The silt loam surface layer and subsoil of the Enfield and Hartland soils are unstable when wet, and consequently the use of wheeled vehicles on these soils is restricted after heavy rain.

URBAN GROUP 2

This group consists of well-drained to excessively drained soils of the Branford, Copake, Enfield, Hartland, Merrimac, and Windsor series that have slopes ranging from 8 to 15 percent. Except for the Hartland, these soils formed on water-laid terraces made up of stratified sand or sand and gravel. The Hartland soils formed in deep silt and very fine sand.

The soils in this group have moderate limitations that affect their use as drainage fields for septic tanks. The percolation rate usually is high and seldom falls below 2 inches per hour. In all the soils except the Hartland, however, the filtration capacity is low and shallow wells may be polluted. Leaching fields are more difficult to install than septic tanks, and in places they require a design that is compatible with sloping terrain.

For homes with basements there are virtually no limitations. Shoring of deep trenches may be necessary to prevent cave-ins.

The limitations for homesite landscaping are moderate to severe. Measures that control erosion are needed on newly seeded slopes, especially in areas of Enfield and Hartland soils. Windsor loamy fine sand has low available moisture capacity and is droughty in summer. Irrigation water may be needed frequently for lawns and shrubs.

The limitations for streets and parking lots and for athletic fields are severe. Considerable land shaping is necessary in preparing sites for parking lots or athletic fields. The droughty Windsor soil is poorly suited to plants that form a turf, and finer textured topsoil is commonly needed.

For sanitary land fills the limitations are moderate for trench fills because of slope, but they are only slight for sidehill fills. On the Enfield and Hartland soils, which are silt loam in the surface layer and subsoil, the use of wheeled vehicles is limited when the soil material is wet.

URBAN GROUP 3

In this group are well-drained soils of the Charlton, Dover, and Gloucester series. These soils formed in loose to firm glacial till. They are friable fine sandy loam or sandy loam in the surface layer and subsoil, and their underlying material is friable or firm fine sandy loam to sand that is gravelly in places. Slopes range from 0 to 8 percent. In some areas a compact, slowly permeable layer occurs at a depth of more than 36 inches.

The percolation rate in the underlying material generally is favorable for septic tank drainage fields, though it varies throughout the year. It is lowest in spring when the soils are wet, but it increases late in spring and early in summer as the soils dry out. In summers when rainfall is below normal for prolonged periods, the rate again decreases.

For homes with basements, excavation is only slightly limited. A few large boulders are present in some places, especially in the stony soils. In many areas the soils are stone free in the surface layer but contain many stones below. The depth to bedrock generally is more than 10 feet. Where the soils have a compact layer at a depth of more than 36 inches, drainage commonly is impeded during early spring thaws.

Limitations for homesite landscaping are slight to moderate. Establishing a lawn is fairly difficult on the Gloucester soils because they are somewhat droughty. Surface stones need to be removed from the stony soils.

Limitations for streets and parking lots and for athletic fields are slight to moderate. In areas having slopes of more than 3 percent, land shaping is needed for parking lots and athletic fields.

For sanitary land fills the limitations are slight to moderate for trench fills and are moderate for sidehill fills. Although trench fills are favored, some of the soils are not suitable as a source of cover material, because they have a high content of stones.

URBAN GROUP 4

This group consists of well-drained Charlton, Dover, and Gloucester soils that have slopes ranging mainly between 8 and 15 percent. These soils formed in loose to firm glacial till. Their surface layer and subsoil are friable fine sandy loam or sandy loam, and their underlying material is friable or firm fine sandy loam to sand that contains gravel in places. In some places slopes are between 3 and 8 percent.

The percolation rate is generally adequate for on-lot disposal of waste, though seasonal variations in the rate can affect the design of drainage fields. A septic tank drainage field is more difficult to establish on these soils than on less sloping soils. Leaching cesspools function satisfactorily if a hard layer or bedrock does not occur within a depth of 8 to 10 feet. These cesspools are especially useful in very stony soils where stones and boulders limit tile installation in drainage fields.

For homes with basements, excavation limitations are slight to moderate. Heavy equipment is required in places where many boulders interfere.

Limitations for homesite landscaping are moderate to severe. Erosion control is necessary on newly seeded lawns, especially those seeded late in fall. Straw mulch, cloth netting, or cut sod reduces the risk of soil losses. Stones must be removed in some places. The Gloucester soils are somewhat droughty in summer.

Limitations for streets and parking lots and for athletic fields are severe. A considerable degree of land shaping is needed for parking lots and athletic fields. Many boulders interfere in places. Turf is readily established on all the soils except the Gloucester, which are somewhat droughty unless they are covered by finer textured topsoil.

For sanitary land fills the limitations are moderate to severe for trench fills but are only slight to moderate for sidehill fills. Soil material excavated locally is difficult to use for cover in trench fills if it contains many stones.

URBAN GROUP 5

In this group are well-drained soils that range from fine sandy loam to silt loam in texture and have slopes of less than 8 percent. These soils are of the Bernardston, Paxton, and Stockbridge series. They formed in firm to compact glacial till. Their surface layer and subsoil have a total thickness of 18 to 30 inches and are friable, but their underlying material is compact and is slowly or very slowly permeable.

The limitations of these soils for onsite sewage disposal systems are severe. The success of a septic tank drainage field depends on its location and depth in relation to the compact layer. If the compact layer is near the surface and if the septic tank system, because of minimum depth requirements, must be installed within it, this slowly or very slowly permeable layer will not permit satisfactory disposal of effluent. Consequently, surface seepage and backups in the house are common. In some places increasing the size of the drainage field compensates for slow permeability in the soil, but solids or bacterial residue from the septic tank may clog the small pores of the compact layer. Frequent inspections and cleaning of the tank are needed to prevent such failure. If the drainage field becomes clogged, it generally must be relocated or provided with an overflow cutoff to an auxiliary system. Another limitation, especially on lower slopes, is a perched water table.

For homes with basements, excavation is only slightly limited. A few boulders lie on the surface in places. Although the soils are well drained, the slowly permeable layer temporarily restricts internal drainage, usually in spring. The position of the soil on the slope is important. More problems occur on middle and lower slopes than on upper slopes. Basements may get wet in spring when the soils are saturated. Footing drains generally carry off the excess water, but locating a suitable outlet can be difficult.

The limitations for homesite landscaping are slight. On slopes exceeding 3 percent, erosion control is needed, especially for seedings made late in fall. In places stones should be removed from the surface.

Limitations for streets and parking lots and for athletic fields are slight to moderate. Land shaping commonly is necessary for parking lots and athletic fields. Constructing and maintaining secondary roads are difficult in some places because of slow internal drainage. Frost heaving can occur if subgrade materials are not adequately drained. Road surfaces formed by oil penetration are subject to frost damage.

For sanitary land fills the limitations are slight to moderate for trench fills and are moderate for sidehill fills. Gentle slopes favor trench fills, but the excavated material is of limited use as cover if the local glacial till is too stony.

URBAN GROUP 6

This group consists of well-drained soils in the Bernardston, Paxton, and Stockbridge series that have slopes ranging mainly from 8 to 15 percent. These soils formed in firm or very firm glacial till. Their surface layer and subsoil have a combined thickness of 18 to 30 inches, and the material in these layers is friable, but the material below them is compact and slowly or very slowly permeable. Some of the soils are very stony and have slopes of 3 to 15 percent.

The soils in this group have severe limitations for on-lot waste disposal systems. The percolation rate in the underlying compact layer is uniformly low; it seldom exceeds 2 inches per hour. Surface seepage of septic tank effluent is common on these steeper slopes. Drainage fields may require special design. Stones and boulders interfere with the installation of septic tank systems in some places. Leaching cesspools generally are unsuitable, except in places where friable material extends below the compacted layer to a considerable depth.

For homes with basements, excavation limitations are moderate. Large boulders lie on the surface in places, especially on the stony and very stony soils. Seepage can occur in foundation holes and trenches on lower slopes, most commonly in the early part of spring. Water moving laterally over the compact layer can build up a perched water table in lower areas. Wet basements are more prevalent on lower slopes than on middle and upper ones.

Limitations for homesite landscaping are moderate to severe. To control erosion, newly seeded slopes should be protected with mulch or cloth. Cut sod is needed for stabilizing slopes where erosion is severe.

Limitations for streets and parking lots and for athletic fields are severe. Extensive land shaping is commonly necessary in preparing sites for parking lots or athletic fields. Constructing and maintaining secondary roads are difficult because of slow internal drainage. For road subgrade, adequate drainage is needed to prevent frost heaving. Road surfaces formed by penetrating oil are especially susceptible to frost damage.

For sanitary land fills the limitations are moderate to severe for trench fills and are moderate for sidehill fills. Slopes favor sidehill fills, but in places the soils are too stony for use as cover material. In lower lying areas, diverting subsurface seepage over the compact layer reduces the probability of contaminating the ground water.

URBAN GROUP 7

In this group are well-drained Bernardston, Charlton, Dover, Gloucester, Paxton, and Stockbridge soils that have slopes exceeding 15 percent. These soils formed in glacial till. Also in the group are Terrace escarpments, a miscellaneous land type that occurs in areas of stratified sandy and gravelly material laid down by water.

The soils in this group are mostly wooded or in pasture. In some places the surface layer is nonstony because the stones have been removed, but in other places there are many surface stones and boulders. Bernardston, Paxton, and Stockbridge soils are underlain by a slowly permeable layer at a depth of less than 30 inches, and such a layer occurs at a depth exceeding 36 inches in some areas of the Charlton, Dover, and Gloucester soils.

Soils in this group have severe limitations for septic tank systems. The systems are difficult to install, and they commonly fail because slopes are steep and because the Bernardston, Paxton, and Stockbridge soils contain a slowly permeable layer. In many places effluent rises to the surface downslope from the drainage field. Leaching cesspools perform satisfactorily in soils that do not contain a slowly permeable layer.

For homes with basements the limitations are moderate to severe. Steep slopes limit the operation of equipment used in excavating and other construction activities. Excavation also is limited, particularly in the very stony soils, by many surface stones and boulders. Water moving laterally over the slowly permeable layer commonly rises to the surface in lower areas of the Bernardston, Paxton, and Stockbridge soils. Here, basements are wet unless the foundations are provided with footing drains.

The limitations for homesite landscaping are severe to very severe. If a lawn is established, management is needed that controls erosion. Some slopes are too steep for lawns unless terraces and retaining walls are built. Many steep areas can be left in their natural cover or planted to vegetation other than grass. Terrace escarpments have low available moisture capacity and are droughty.

Limitations for streets and parking lots and for athletic fields are severe to very severe. The amount of land shaping needed may prohibit the use of some areas for parking lots and athletic fields that require a nearly level surface. Roads formed by oil penetration are susceptible to frost heaving.

For sanitary land fills the limitations are severe to very severe for trench fills but are only slight to moderate for sidehill fills. Because of steep slopes, trench fills are impractical, except in some areas of Terrace escarpments where material can be excavated locally and used for cover. The use of very stony soils for sidehill fills is moderately limited. In the Bernardston, Paxton, and Stockbridge soils, diversion of subsurface seepage is needed in some places to reduce contamination of the ground water.

URBAN GROUP 8

This group consists of Sutton soils that formed in loose to firm glacial till; Deerfield, Hero, Sudbury, and Tisbury soils that formed in deep, stratified sand or sand and gravel; and Belgrade soils that formed in deep silt

and very fine sand. All of these soils are moderately well drained. Slopes generally are less than 8 percent, but the very stony Sutton soils have slopes ranging between 0 and 15 percent. Textures range from silt loam to loamy fine sand in the surface layer and subsoil and from fine sandy loam to sand and gravel in the underlying material.

The limitations of the soils for on-lot waste disposal systems are moderate. The percolation rate is variable, but all the soils have a temporary high water table that may flood the drainage field and cause backups in the house at any time from late in fall to early in spring. Because the water table fluctuates rapidly, these failures usually are of short duration. In level areas runoff is ponded during early spring thaws, and this also can saturate the drainage field and cause backups. In the stony and very stony Sutton soils, many stones and boulders interfere with the installation of tile drains.

For homes with basements, excavation is moderately limited. Many boulders occur in some areas of the very stony Sutton soils. Unless drainage is improved, seepage in foundation holes and trenches can hinder construction early in spring. In the Belgrade, Deerfield, Hero, Sudbury, and Tisbury soils, deep trenches should be shored up to prevent slumping and cave-ins. If drainage is inadequate, wet basements are common early in spring when the water table is high or when runoff collects in nearly level areas.

Limitations for homesite landscaping are moderate to severe. In some places the surface stones need to be removed from the Sutton soils. To control soil losses, newly seeded areas having slopes of more than 8 percent should be protected with cloth or mulch. Trees and shrubs tolerant of excess moisture are suitable for planting.

Limitations for streets and parking lots and for athletic fields generally are moderate, but they are severe on the very stony Sutton soil that has slopes of 3 to 15 percent. Some land shaping is needed for improving the site and for providing adequate drainage.

For sanitary land fills the limitations are moderate to severe for trench fills and are moderate for sidehill fills. Although slopes favor trench fills, a seasonal high water table limits this type of operation unless drainage is improved or runoff is diverted. In areas that are too stony, cover material from the Sutton soils is undesirable. The use of wheeled vehicles is difficult on the Belgrade soils when they are wet.

URBAN GROUP 9

This group consists of moderately well drained Amenia and Woodbridge soils that formed in firm to very firm, compact glacial till. These soils have a slowly permeable layer at a depth of 18 to 30 inches. They are dominantly silt loam and fine sandy loam throughout. Slopes range from 0 to 15 percent, and in some places the surface layer is stony or very stony.

These soils have severe limitations that affect their use for onsite sewage disposal systems. The percolation rate in the compact layer is low, and in many places the water table is high from late in fall to early in summer. Effluent commonly rises to the surface downslope from the drainage field. Backups can occur when the water table is high and the drainage field is saturated. Leaching cesspools are inefficient for disposing of effluent because permeability in the compact layer is slow.

For homes with basements, excavation limitations are moderate. A perched water table is common, especially on lower slopes. Excavations may be filled with water during construction unless lateral seepage is diverted. Surface runoff is ponded in nearly level areas during early spring thaws. Footing drains and diversion of runoff are needed to help keep basements dry.

The limitations for homesite landscaping are moderate to severe. Hay mulch or cloth netting helps to control erosion in newly seeded areas having slopes of more than 3 percent. In many places the surface stones need to be removed. In level and nearly level areas, where subsurface drainage is slow and the water table stays high until early in summer, trees and shrubs used in plantings should be tolerant of excess moisture.

Limitations for streets and parking lots and for athletic fields are moderate to severe. A seasonal high water table must be lowered, and some land shaping is needed for improving sites where slopes exceed 3 percent. If slopes are greater than 8 percent, extensive land shaping is required for parking lots and athletic fields.

For sanitary land fills the limitations are moderate for trench fills and for sidehill fills. Although slopes favor trench fills, this type of operation is restricted unless drainage is improved or runoff is diverted. Soil layers that have a high stone content are unsuitable as a source of cover material.

URBAN GROUP 10

This group consists of Rock land, a miscellaneous land type, and rocky to extremely rocky, well-drained to somewhat excessively drained soils of the Farmington, Hollis, Holyoke, and Shapleigh series. These soils generally are less than 20 inches deep to bedrock. In most places outcrops of rock make up 5 to 50 percent of the land surface. Textures in the surface layer and subsoil are silt loam, fine sandy loam, and sandy loam. Slopes generally range from 3 to 25 percent, but some areas are steeper. Outcropping rock covers more than 50 percent of the surface of Rock land.

The limitations of the soils for on-lot sewage disposal are severe to very severe. Shallowness severely restricts the installation of septic tank drainage systems, but some areas have scattered inclusions of deeper soils on which dwellings can be built. Only by detailed examination can the location and extent of these included areas of deeper soils be determined.

For homes with basements, excavation limitations are severe to very severe. Blasting is commonly necessary when foundations are excavated. In a few places lateral seepage is a hazard where water cannot move downward through cracks in the rocks. Footing drains are useful in these places.

Limitations for homesite landscaping are severe to very severe. Rooting of trees and shrubs is restricted because the soils are shallow. In areas where many cracks occur in the bedrock, roots can penetrate more deeply. Stones, boulders, and bedrock outcrops interfere with the establishment of lawns. Most areas, especially the steeper ones, should be left in native vegetation or terraced. The

soils have limited available moisture capacity and are somewhat droughty.

Limitations for streets and parking lots and for athletic fields are severe to very severe. Slope, shallowness, and many outcrops of rock make the use of these soils for parking lots and athletic fields unlikely. Constructing secondary roads is costly because blasting is commonly required to establish the proper grade.

For sanitary land fills the limitations are very severe for trench fills and are severe to very severe for sidehill fills.

URBAN GROUP 11

This group consists of poorly drained soils that formed in loose to very firm, compact glacial till or in stratified, water-laid deposits. These soils are of the Au Gres, Fredon, Kendaia, Leicester, Lyons, Raynham, Ridgebury, Walpole, Wareham, and Whitman series. Their texture ranges from silt loam to sand, and in places it is gravelly. Some of the Kendaia, Leicester, Lyons, Ridgebury, and Whitman soils are stony or very stony.

The soils of this group generally lie in drainageways and depressions, where the limitations for on-lot sewage disposal are severe to very severe. In most places the water table is at the surface or within 12 inches of the surface from late in fall until the last part of spring. The soils are unsuitable for disposing of septic tank effluent unless they are drained or covered with additional soil material. Moreover, the Kendaia and Ridgebury soils have a slowly permeable layer that severely restricts the use of leaching systems. The very stony soils contain many stones and boulders that limit the installation of septic tank drainage fields.

For homes with basements, the excavation limitations are severe. Improved drainage and additions of fill are needed in most areas, and the growth of lawns and planted trees and shrubs depends on the quality of the fill material and topsoil used in final grading. If the grade is raised by adding fill, wells should be provided at the base of large shade trees.

The limitations for homesite landscaping are severe, mainly because of the high water table. Most sites require improved drainage, added fill material, and topsoil. Where the grade has been raised by adding fill, wells should be provided at the base of large shade trees.

Limitations for streets and parking lots and for athletic fields are severe to very severe. Steep slopes, limited soil depth, and many outcrops of rock make the use of the soils for these purposes unlikely. Constructing secondary roads is costly because blasting is commonly needed to establish the proper grade.

For sanitary land fills the limitations are severe for both trench fills and sidehill fills. Trench fills are practical only if measures are used for preventing contamination of the ground water. Such measures include improving drainage to lower the water table, ditching to divert subsurface seepage or surface runoff, and placing impervious material at the bottom of the trench. Sidehill fills are restricted because of insufficient slope. Limitations to use of the soils as a source of cover material are stoniness in soils developed on glacial till and unstable silt and very fine sand in the Au Gres, Fredon, Kendaia, Raynham, and Wareham soils.

URBAN GROUP 12

In this group are nearly level, very poorly drained soils of the Birdsall, Granby, Lyons, Scarboro, and Whitman series. These soils formed in glacial till or in water-laid deposits. They range from silt loam to loamy sand or sand, and in places they contain some gravel. Generally, the soils occur in drainageways and depressions. Also in this group are the land types, Muck, shallow, and Peat and Muck.

These soils have very severe limitations for onsite sewage disposal systems. The water table falls below a depth of 24 inches only in the dry part of summer. Water usually stands on the surface in spring and at times even in summer. Septic tank systems cannot operate under these conditions. A septic tank can be used if the site is extensively prepared, but success is uncertain.

For homes with basements, excavation is very severely limited by a high water table. Most foundation holes become filled with water. Site improvement requires adequate drainage and the addition of fill. Also, many stones and boulders occur in the Whitman soil. Peat and Muck are unstable and do not provide a suitable base for fill. For this reason, the organic material should be removed before fill is added.

The limitations for homesite landscaping are very severe because of a high water table. After drainage is improved, a lawn can be established if fill material is applied where needed and if topsoil of good quality is used in final grading. Where the grade is raised by adding fill, wells should be provided at the base of large shade trees.

Limitations for streets and parking lots and for athletic fields are very severe. Improved drainage and the addition of fill material are needed for improving the site. Because Peat and Muck are unstable, the organic material should be removed before fill is added.

For sanitary land fills the limitations are very severe for trench fills and sidehill fills. Trench fills are impractical because of the high water table, and sidehill fills are limited because of insufficient slope.

URBAN GROUP 13

This group consists mainly of well-drained to very poorly drained alluvial soils on the flood plains of major rivers and their tributaries. These soils vary widely in texture and internal drainage. They are of the Eel, Genesee, Limerick, Ondawa, Podunk, Rumney, Saco, and Suncook series. Also in the group are Alluvial land and Riverwash.

Because flooding is a hazard, all the soils in this group are of limited use as building sites. They are used mainly for farming and recreation, but the higher areas can be used more extensively if floods are controlled.

The limitations for onsite sewage disposal systems are severe to very severe. Septic tanks may work satisfactorily in the well-drained Genesee, Ondawa, and Suncook soils when streams are low, but they are likely to pollute the water during periodic flooding.

Excavation limitations for homes with basements are severe to very severe and are related to the water table and flooding.

Limitations for homesite landscaping are slight to severe, depending on depth to the water table and frequency of flooding. Lawns can be readily established and

maintained on the well-drained parts of the flood plains. The well drained Genesee soils and the moderately well drained Eel soils have high available moisture capacity and are suitable for producing turf commercially.

The limitations for streets and parking lots are severe to very severe because of the flood hazard. Loose surfaced parking lots are practical on the soils that can support wheeled vehicles satisfactorily. The Ondawa, Podunk, and Suncook soils are more stable than the Eel and Genesee soils.

The limitations for athletic fields are slight to very severe and are determined by the height of the water table and the frequency of flooding. Constructing permanent structures is risky unless floods are controlled.

For sanitary land fills the limitations are severe to very severe for trench fills and sidehill fills. Sites can be improved by diking to control the washing of fill material by floodwater, improving drainage to lower the water table, using impermeable material at the base of fills to prevent pollution of the ground water, and controlling runoff from the fill area. The Eel, Genesee, and Limerick soils are less suitable as a source of cover material than the Ondawa, Podunk, Rumney, and Suncook soils.

Use of Soils for Wildlife [3]

Table 5 lists the soils in the county and rates the hazards or limitations that affect their suitability for eight kinds of wildlife habitat and for three kinds of wildlife. The ratings are 1, 2, 3, and 4, each number indicating progressively greater soil limitations that restrict use for the specified kind of habitat or kind of wildlife. A rating of 1 indicates that only *slight* limitations affect use of the soil. A rating of 2 shows that limitations are *moderate* but can be overcome or corrected through fairly frequent attention and moderately intensive management. A rating of 3 indicates that limitations are *severe*; use of the soil is seriously limited by a hazard or restriction that is difficult and commonly expensive to overcome. A rating of 4 indicates that limitations are *very severe*; use of the soil is highly impractical or impossible.

The ratings can be used as an aid in selecting the better soils for creating, improving, or maintaining specific kinds of wildlife habitat; in determining the intensity of management needed in a specific habitat; and in selecting large areas that are suitable for refuges, parks, and other recreational developments.

The kinds of wildlife habitats are discussed in the following paragraphs.

Wildlife Habitat

Each soil is rated in table 5 according to the degree of limitations that influence the creation, improvement, and maintenance of eight elements, or kinds, of habitat. A given soil feature does not necessarily affect all kinds of habitat equally. Slope, for example, may be only a moderate limitation for one habitat but a severe or very severe limitation for another.

Grain and seed crops include corn, sorghum, wheat, oats, millet, buckwheat, sunflower, and other annuals that produce grain or grainlike seeds used by wildlife.

Grasses and legumes include fescue, bromegrass, bluegrass, timothy, redtop, orchardgrass, reed canarygrass, clover, trefoil, alfalfa, and panicgrasses. All of these are commonly planted for forage but also are valuable for wildlife.

Wild herbaceous upland plants consist of native or introduced perennial grasses and forbs (weeds) that commonly grow in upland areas and are established naturally. Examples are bluestem, indiangrass, panicgrass, wild ryegrass, oatgrass, pokeweed, strawberry, lespedeza, beggarweed, nightshade, goldenrod, and ragweed.

Hardwood woody plants are nonconiferous trees, shrubs, and woody vines that produce nuts or other fruits, buds, catkins, foliage, or twigs that are used extensively as wildlife food. They are established naturally or are planted. Among these plants are oak, beech, cherry, hawthorn, dogwood, viburnum, maple, birch, poplar, grape, honeysuckle, blueberry, blackberry, greenbrier, autumn-olive, and multiflora rose.

Coniferous woody plants are cone-bearing trees and shrubs that are established naturally or are planted. They are important to wildlife mainly as cover, but they also furnish browse, seeds, or fruitlike cones. Examples are spruce, pine, white-cedar, hemlock, balsam fir, redcedar, juniper, and yew. Coniferous trees and shrubs that grow slowly and delay closing the canopy provide cover and food for a larger number and a greater variety of wildlife than coniferous plants that grow more rapidly. Soil properties, therefore, that promote rapid growth and canopy closure are considered limitations.

Wetland food and cover plants are wild, annual or perennial herbaceous plants, exclusive of submerged or floating aquatics, that grow in moist to wet areas. These plants provide food and cover for waterfowl and furbearing animals. They include smartweed, wild millet, bulrush, various rushes and sedges, burreed, wildrice, rice cutgrass, mannagrass, and cattail.

Shallow water developments are impoundments or excavations for controlling water, generally not more than 6 feet deep. Examples are low dikes and levees; shallow dugouts; level ditches; and devices for controlling water in marshy drainageways or channels.

Excavated ponds are dug-out ponds, or a combination of dug-out areas and low dikes, that contain water of suitable quality, of suitable depth, and in ample supply for the production of fish or wildlife. These ponds depend on ground water, not runoff. If fish are to be produced, at least one-fourth of the pond should be 6 feet or more.

Kinds of Wildlife

Table 5 rates the limitations that affect suitability of the soils for three kinds of wildlife—openland, woodland, and wetland wildlife. The ratings are based on a weighted average of the ratings given to kinds of habitat in the table.

Openland wildlife consists of birds and mammals that commonly frequent cropland, meadow, pasture, and areas overgrown with grasses, weeds, and shrubs. Examples are ring-neck pheasant, mourning dove, woodcock, cottontail rabbit, red fox, and woodchuck.

[3] Edwin A. Swenson, Jr., biologist, Soil Conservation Service, assisted in preparing this subsection.

TABLE 5.—*Suitability of the soils for kinds of wildlife habitat and for kinds of wildlife*

[Ratings 1, 2, 3, and 4 are explained in the text]

Soil series and map symbols	Kinds of wildlife habitat								Kinds of wildlife		
	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood woody plants	Coniferous woody plants	Wetland food and cover plants	Shallow water developments	Excavated ponds	Openland wildlife	Woodland wildlife	Wetland wildlife
Alluvial land: Am	3	2	2	1	2	2	3	4	2	1	3
Amenia:											
AnA	2	1	1	1	3	3	3	3	1	1	3
AnB, AnC	2	1	1	1	3	4	4	4	1	1	4
AoB, AoC	3	2	1	1	3	4	4	4	2	2	4
ApC	4	3	1	1	3	4	4	4	3	2	4
Au Gres: Au	3	2	2	1	2	1	1	1	2	1	1
Belgrade:											
BaA	2	1	1	1	3	3	3	3	1	1	3
BaB	2	1	1	1	3	4	4	4	1	1	4
Bernardston:											
BqB, BqC	2	1	1	1	3	4	4	4	1	1	4
BuB, BuC	3	2	1	1	3	4	4	4	2	2	4
BwC, BwD	4	3	1	1	3	4	4	4	3	2	4
Birdsall: Bz	4	3	3	1	1	1	1	1	3	1	1
Borrow and fill land: Bk, Bl	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]
Branford: BoB, BoC	2	1	1	1	3	4	4	4	1	1	4
Charlton:											
CaA	1	1	1	1	3	4	4	4	1	1	4
CaB, CaB2, CaC, CaC2	2	1	1	1	3	4	4	4	1	1	4
CaD, CaE, ChB, ChC	3	2	1	1	3	4	4	4	2	2	4
ChD, CrC, CrD	4	3	1	1	3	4	4	4	3	2	4
Copake:											
CwA	1	1	1	1	3	4	4	4	1	1	4
CwB, CwC	2	1	1	1	3	4	4	4	1	1	4
Deerfield: DeA	2	1	1	1	3	3	3	3	1	1	3
Dover:											
DoA	1	1	1	1	3	4	4	4	1	1	4
DoB, DoC, DoD, DvB, DvC	2	1	1	1	3	4	4	4	1	1	4
Eel: Ee	2	1	1	1	3	3	3	3	1	1	3
Enfield:											
EsA	1	1	1	1	3	4	4	4	1	1	4
EsB, EsC	2	1	1	1	3	4	4	4	1	1	4
Farmington: FaC, FaE, FmC, FmE	4	4	3	3	1	4	4	4	4	3	4
Fredon: Fr	3	2	2	1	2	1	1	1	2	1	1
Genesee: Gf	1	1	1	1	3	4	4	4	1	1	4
Gloucester:											
GaB, GaC	2	1	1	2	3	4	4	4	1	2	4
GaD, GbB, GbC	3	2	1	1	3	4	4	4	3	2	4
GbD, GeC, GeE	4	3	1	1	3	4	4	4	3	2	4
Granby: Gn	4	3	3	1	1	1	1	1	3	1	1
Groton: GrA, GrC	2	2	2	2	1	4	4	4	2	3	4

See footnotes at end of table.

TABLE 5.—*Suitability of the soils for kinds of wildlife habitat and for kinds of wildlife*—Continued

Soil series and map symbols	Kinds of wildlife habitat								Kinds of wildlife		
	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood woody plants	Coniferous woody plants	Wetland food and cover plants	Shallow water developments	Excavated ponds	Openland wildlife	Woodland wildlife	Wetland wildlife
Hartland:											
HbA	1	1	1	1	3	4	4	4	1	1	4
HbB, HbC	2	1	1	1	3	4	4	4	1	1	4
Hero:											
HeA	2	1	1	1	3	3	3	3	1	1	3
HeB	2	1	1	1	3	4	4	4	1	1	4
Hinckley:											
HkA, HkC	2	2	2	2	1	4	4	4	2	3	4
HmA, HmC	3	3	3	3	1	4	4	4	3	3	4
Hollis:											
HoC	4	3	2	2	2	4	4	4	3	2	4
HrC, HrE, HxC, HxE	4	4	3	3	1	4	4	4	4	3	4
Holyoke: HyC, HzE	4	4	3	3	1	4	4	4	4	3	4
Kendaia:											
Ka	3	2	2	1	2	1	1	1	2	1	1
Ke	4	3	2	1	2	1	2	2	3	2	1
Leicester:											
Lc	3	2	2	1	2	1	1	1	2	1	1
Le, Lg	4	3	2	1	2	1	2	2	3	2	1
Limerick: Lm	3	2	2	1	2	2	3	4	2	1	3
Lyons: Ly	4	3	3	1	1	1	1	1	3	1	1
Made land: Ma	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Merrimac: MyA, MyB, MyC	2	1	2	2	3	4	4	4	1	2	4
Muck, shallow: Pm	4	3	3	1	1	1	1	1	3	1	1
Ondawa: On	1	1	1	1	3	4	4	4	1	1	4
Paxton:											
PbA	1	1	1	1	3	4	4	4	1	1	4
PbB, PbB2, PbC, PbC2	2	1	1	1	3	4	4	4	1	1	4
PbD, PbD2, PbE, PdB, PdC	3	2	1	1	3	4	4	4	2	2	4
PdD, PeA, PeC, PeD	4	3	1	1	3	4	4	4	3	2	4
Peat and Muck: Pk	4	4	4	4	1	3	1	2	4	3	1
Podunk: Po	2	1	1	1	3	3	3	3	1	1	3
Raynham: Rc	3	2	2	1	2	1	1	1	2	1	1
Ridgebury: Rd, Rg	3	2	2	1	2	1	1	1	2	1	1
Riverwash: Re	4	4	4	4	4	4	4	4	4	4	4
Rock land: Rh	4	4	4	4	3	4	4	4	4	3	4
Rumney: Ru	3	2	2	1	2	2	3	4	2	1	3
Saco: Sb	4	3	3	1	1	1	4	4	3	1	3
Scarboro: Sf	4	3	3	1	1	1	1	1	3	1	1
Shapleigh: SkC, SkE, SmC, SmE	4	4	3	3	1	4	4	4	4	3	4

See footnotes at end of table.

TABLE 5.—*Suitability of the soils for kinds of wildlife habitat and for kinds of wildlife*—Continued

Soil series and map symbols	Kinds of wildlife habitat								Kinds of wildlife		
	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood woody plants	Coniferous woody plants	Wetland food and cover plants	Shallow water developments	Excavated ponds	Openland wildlife	Woodland wildlife	Wetland wildlife
Stockbridge:											
SnA	1	1	1	1	3	4	4	4	1	1	4
SnB, SnB2, SnC, SnC2	2	1	1	1	3	4	4	4	1	1	4
SnD2, SpB, SpC	3	2	1	1	3	4	4	4	2	2	4
SpD, SrC, SrD	4	3	1	1	3	4	4	4	3	2	4
Suncook: St	1	1	1	1	3	4	4	4	1	1	4
Sutton:											
SvA	2	1	1	1	3	3	3	3	1	1	3
SvB	2	1	1	1	3	4	4	4	1	1	4
SwA	3	2	1	1	3	3	3	3	2	2	3
SwB	3	2	1	1	3	4	4	4	3	2	4
SxA, SxC	4	3	1	1	3	4	4	4	3	2	4
Terrace escarpments: Tg	3	3	3	3	1	4	4	4	3	3	4
Tisbury and Sudbury:											
TwA	2	1	1	1	3	3	3	3	1	1	3
TwB	2	1	1	1	3	4	4	4	1	1	4
Walpole and Raynham: Wl	3	2	2	1	2	1	1	1	2	1	1
Wareham: Wmx	4	3	3	1	1	1	1	1	3	1	1
Whitman: Wp	4	3	3	1	1	1	1	1	3	1	1
Windsor: WvA, WvB, WvC	3	3	3	3	1	4	4	4	3	3	4
Woodbridge:											
WxA	2	1	1	1	3	3	3	3	1	1	3
WxB, WxC	2	1	1	1	3	4	4	4	1	1	4
WyA	3	2	1	1	3	3	3	3	2	2	3
WyB, WyC	3	2	1	1	3	4	4	4	2	2	4
WzA	4	3	1	1	3	3	3	3	3	2	3
WzC	4	3	1	1	3	4	4	4	3	2	4

[1] Variable.

Woodland wildlife consists of birds and mammals that normally frequent wooded areas. Examples are ruffed grouse, white-tail deer, squirrel, raccoon, red fox, and wildcat.

Wetland wildlife consists of birds and mammals that commonly frequent ponds, marshes, swamps, and other wet areas. Among these animals are ducks, geese, heron, snipe, rail, coot, muskrat, mink, and beaver.

Descriptions of the Soils

This section describes the soil series and mapping units of Litchfield County. The acreage and proportionate extent of each mapping unit are given in table 6.

The procedure in this section is first to describe the soil series, and then the mapping units in that series. Thus, to get full information on any one mapping unit, it is necessary to read the description of that unit and also the description of the series to which it belongs. The description of a soil series mentions features that apply to all the soils in the series. Differences among the soils of one series are pointed out in the description of the individual soils or are indicated in the soil name.

Each series contains a short description of a typical soil profile and a much more detailed description of the same profile that scientists, engineers, and others can use in making highly technical interpretations.

As mentioned in the section "How This Survey Was Made," not all mapping units are members of a soil series. Alluvial land and Riverwash, for example, do not belong to a soil series, but, nevertheless, are listed in alphabetical order along with the soil series.

TABLE 6.—*Approximate acreage and proportionate extent of the soils*

Soil	Area	Extent	Soil	Area	Extent
	Acres	*Percent*		*Acres*	*Percent*
Alluvial land	1, 701	0. 3	Genesee silt loam	990	0. 2
Amenia silt loam, 0 to 3 percent slopes	442	. 1	Gloucester sandy loam, 3 to 8 percent slopes	761	. 1
Amenia silt loam, 3 to 8 percent slopes	2, 784	. 5	Gloucester sandy loam, 8 to 15 percent slopes	962	. 2
Amenia silt loam, 8 to 15 percent slopes	116	(1)	Gloucester sandy loam, 15 to 25 percent slopes	389	. 1
Amenia stony silt loam, 3 to 8 percent slopes	668	. 1	Gloucester stony sandy loam, 3 to 8 percent slopes	545	. 1
Amenia stony silt loam, 8 to 15 percent slopes	163	(1)	Gloucester stony sandy loam, 8 to 15 percent slopes	466	. 1
Amenia very stony silt loam, 3 to 15 percent slopes	441	. 1	Gloucester stony sandy loam, 15 to 25 percent slopes	195	(1)
Au Gres loamy fine sand	294	(1)	Gloucester very stony sandy loam, 3 to 15 percent slopes	2, 805	. 5
Belgrade silt loam, 0 to 3 percent slopes	773	. 1	Gloucester very stony sandy loam, 15 to 35 percent slopes	1, 459	. 2
Belgrade silt loam, 3 to 8 percent slopes	321	. 1	Granby loamy fine sand	650	. 1
Bernardston silt loam, 3 to 8 percent slopes	466	. 1	Groton gravelly sandy loam, 0 to 3 percent slopes	480	. 1
Bernardston silt loam, 8 to 15 percent slopes	488	. 1	Groton gravelly sandy loam, 3 to 15 percent slopes	2, 004	. 3
Bernardston stony silt loam, 3 to 8 percent slopes	153	(1)	Hartland silt loam, 0 to 3 percent slopes	938	. 1
Bernardston stony silt loam, 8 to 15 percent slopes	204	(1)	Hartland silt loam, 3 to 8 percent slopes	525	. 1
Bernardston very stony silt loam, 3 to 15 percent slopes	2, 647	. 4	Hartland silt loam, 8 to 15 percent slopes	255	(1)
Bernardston very stony silt loam, 15 to 25 percent slopes	1, 305	. 2	Hero loam, 0 to 3 percent slopes	816	. 1
Birdsall silt loam	2, 390	. 4	Hero loam, 3 to 8 percent slopes	479	. 1
Borrow and fill land, coarse material	2, 766	. 5	Hinckley gravelly sandy loam, 0 to 3 percent slopes	742	. 1
Borrow and fill land, loamy material	3, 037	. 5	Hinckley gravelly sandy loam, 3 to 15 percent slopes	35, 037	5. 9
Branford loam, 3 to 8 percent slopes	133	(1)	Hinckley gravelly loamy sand, 0 to 3 percent slopes	698	. 1
Branford loam, 8 to 15 percent slopes	186	(1)	Hinckley gravelly loamy sand, 3 to 15 percent slopes	1, 621	. 3
Charlton fine sandy loam, 0 to 3 percent slopes	328	. 1	Hollis rocky fine sandy loam, 3 to 15 percent slopes	3, 788	. 6
Charlton fine sandy loam, 3 to 8 percent slopes	12, 363	2. 1	Hollis very rocky fine sandy loam, 3 to 15 percent slopes	34, 537	5. 8
Charlton fine sandy loam, 3 to 8 percent slopes, eroded	618	. 1	Hollis very rocky fine sandy loam, 15 to 35 percent slopes	21, 829	3. 6
Charlton fine sandy loam, 8 to 15 percent slopes	7, 259	1. 2	Hollis extremely rocky fine sandy loam, 3 to 15 percent slopes	25, 959	4. 3
Charlton fine sandy loam, 8 to 15 percent slopes, eroded	970	. 2	Hollis extremely rocky fine sandy loam, 15 to 35 percent slopes	43, 281	7. 2
Charlton fine sandy loam, 15 to 25 percent slopes	2, 687	. 4	Holyoke very rocky silt loam, 3 to 15 percent slopes	205	(1)
Charlton fine sandy loam, 25 to 35 percent slopes	294	(1)	Holyoke extremely rocky silt loam, 15 to 35 percent slopes	310	. 1
Charlton stony fine sandy loam, 3 to 8 percent slopes	6, 654	1. 1	Kendaia silt loam	1, 206	. 2
Charlton stony fine sandy loam, 8 to 15 percent slopes	4, 718	. 8	Kendaia-Lyons very stony silt loams	1, 113	. 2
Charlton stony fine sandy loam, 15 to 25 percent slopes	3, 055	. 5	Leicester fine sandy loam	1, 274	. 2
Charlton very stony fine sandy loam, 3 to 15 percent slopes	49, 561	8. 3	Leicester stony fine sandy loam	1, 044	. 2
Charlton very stony fine sandy loam, 15 to 35 percent slopes	33, 777	5. 6	Leicester, Ridgebury and Whitman very stony fine sandy loams	26, 524	4. 4
Copake loam, 0 to 3 percent slopes	1, 130	. 2	Limerick silt loam	2, 856	. 5
Copake loam, 3 to 8 percent slopes	3, 413	. 6	Lyons silt loam	553	. 1
Copake loam, 8 to 15 percent slopes	927	. 1	Made land	641	. 1
Deerfield loamy fine sand, 0 to 3 percent slopes	340	. 1	Merrimac sandy loam, 0 to 3 percent slopes	2, 648	. 4
Dover fine sandy loam, 0 to 3 percent slopes	228	(1)	Merrimac sandy loam, 3 to 8 percent slopes	5, 298	. 9
Dover fine sandy loam, 3 to 8 percent slopes	1, 479	. 2	Merrimac sandy loam, 8 to 15 percent slopes	4, 111	. 7
Dover fine sandy loam, 8 to 15 percent slopes	651	. 1	Muck, shallow	1, 287	. 2
Dover fine sandy loam, 15 to 25 percent slopes	261	(1)	Ondawa fine sandy loam	1, 605	. 3
Dover stony fine sandy loam, 3 to 8 percent slopes	202	(1)	Paxton fine sandy loam, 0 to 3 percent slopes	1, 866	. 3
Dover stony fine sandy loam, 8 to 15 percent slopes	306	. 1	Paxton fine sandy loam, 3 to 8 percent slopes	24, 137	4. 0
Eel silt loam	1, 158	. 2	Paxton fine sandy loam, 3 to 8 percent slopes, eroded	1, 814	. 3
Enfield silt loam, 0 to 3 percent slopes	639	. 1	Paxton fine sandy loam, 8 to 15 percent slopes	9, 350	1. 6
Enfield silt loam, 3 to 8 percent slopes	1, 450	. 2	Paxton fine sandy loam, 8 to 15 percent slopes, eroded	4, 187	. 7
Enfield silt loam, 8 to 15 percent slopes	384	. 1	Paxton fine sandy loam, 15 to 25 percent slopes	3, 380	. 6
Farmington very rocky silt loam, 3 to 15 percent slopes	3, 748	. 6	Paxton fine sandy loam, 15 to 25 percent slopes, eroded	1, 127	. 2
Farmington very rocky silt loam, 15 to 35 percent slopes	1, 744	. 3	Paxton fine sandy loam, 25 to 35 percent slopes	322	. 1
Farmington extremely rocky silt loam, 3 to 15 percent slopes	811	. 1	Paxton stony fine sandy loam, 3 to 8 percent slopes	5, 083	. 8
Farmington extremely rocky silt loam, 15 to 35 percent slopes	1, 106	. 2			
Fredon silt loam	821	. 1			

See footnotes at end of table.

TABLE 6.—*Approximate acreage and proportionate extent of the soils*—Continued

Soil	Area	Extent	Soil	Area	Extent
	Acres	*Percent*		*Acres*	*Percent*
Paxton stony fine sandy loam, 8 to 15 percent slopes	3, 163	0. 5	Stockbridge very stony loam, 15 to 35 percent slopes	396	0. 1
Paxton stony fine sandy loam, 15 to 25 percent slopes	2, 060	. 3	Suncook loamy fine sand	941	. 1
Paxton very stony fine sandy loam, 0 to 3 percent slopes	844	. 1	Sutton fine sandy loam, 0 to 3 percent slopes	252	(1)
Paxton very stony fine sandy loam, 3 to 15 percent slopes	21, 869	3. 6	Sutton fine sandy loam, 3 to 8 percent slopes	1, 256	. 2
Paxton very stony fine sandy loam, 15 to 35 percent slopes	10, 255	1. 7	Sutton stony fine sandy loam, 0 to 3 percent slopes	161	(1)
Peat and Muck	12, 154	2. 0	Sutton stony fine sandy loam, 3 to 8 percent slopes	895	. 1
Podunk fine sandy loam	1, 424	. 2	Sutton very stony fine sandy loam, 0 to 3 percent slopes	919	. 1
Raynham silt loam	1, 369	. 2	Sutton very stony fine sandy loam, 3 to 15 percent slopes	7, 664	1. 3
Ridgebury fine sandy loam	2, 378	. 4	Terrace escarpments	7, 807	1. 3
Ridgebury stony fine sandy loam	1, 408	. 2	Tisbury and Sudbury soils, 0 to 3 percent slopes	1, 544	. 3
Riverwash	310	. 1	Tisbury and Sudbury soils, 3 to 8 percent slopes	1, 203	. 2
Rock land	12, 085	2. 0	Walpole and Raynham soils	1, 657	. 3
Rumney fine sandy loam	1, 782	. 3	Wareham loamy fine sand, nonacid variant	457	. 1
Saco silt loam	3, 399	. 6	Whitman stony fine sandy loam	1, 044	. 2
Scarboro loamy fine sand	2, 119	. 4	Windsor loamy fine sand, 0 to 3 percent slopes	908	. 1
Shapleigh very rocky sandy loam, 3 to 15 percent slopes	281	(1)	Windsor loamy fine sand, 3 to 8 percent slopes	856	. 1
Shapleigh very rocky sandy loam, 15 to 35 percent slopes	90	(1)	Windsor loamy fine sand, 8 to 15 percent slopes	262	(1)
Shapleigh extremely rocky sandy loam, 3 to 15 percent slopes	148	(1)	Woodbridge fine sandy loam, 0 to 3 percent slopes	1, 044	. 2
Shapleigh extremely rocky sandy loam, 15 to 35 percent slopes	349	. 1	Woodbridge fine sandy loam, 3 to 8 percent slopes	7, 981	1. 3
Stockbridge loam, 0 to 3 percent slopes	394	. 1	Woodbridge fine sandy loam, 8 to 15 percent slopes	1, 485	. 2
Stockbridge loam, 3 to 8 percent slopes	5, 561	. 9	Woodbridge stony fine sandy loam, 0 to 3 percent slopes	346	. 1
Stockbridge loam, 3 to 8 percent slopes, eroded	579	. 1	Woodbridge stony fine sandy loam, 3 to 8 percent slopes	2, 642	. 4
Stockbridge loam, 8 to 15 percent slopes	2, 153	. 4	Woodbridge stony fine sandy loam, 8 to 15 percent slopes	613	. 1
Stockbridge loam, 8 to 15 percent slopes, eroded	1, 891	. 3	Woodbridge very stony fine sandy loam, 0 to 3 percent slopes	1, 573	. 3
Stockbridge loam, 15 to 25 percent slopes, eroded	887	. 1	Woodbridge very stony fine sandy loam, 3 to 15 percent slopes	16, 380	2. 7
Stockbridge stony loam, 3 to 8 percent slopes	525	. 1			
Stockbridge stony loam, 8 to 15 percent slopes	603	. 1			
Stockbridge stony loam, 15 to 25 percent slopes	390	. 1			
Stockbridge very stony loam, 3 to 15 percent slopes	832	. 1	Total	600, 320	100. 0

[1] Less than 0.05 percent.

Following the name of each mapping unit, there is a symbol in parentheses. This symbol identifies the mapping unit on the detailed soil map. Listed at the end of each description is the capability unit, woodland suitability group, and urban group in which the mapping unit has been placed. The pages on which each capability unit, each woodland group, and each urban group are described can be found by referring to the "Guide to Mapping Units" at the back of the soil survey.

The color of each soil horizon is described in words, such as grayish brown, but it can also be indicated by symbols for the hue, value, and chroma, such as 10YR 5/2. These symbols, called Munsell color notations, are explained in the "Soil Survey Manual" (*19*). They are used by soil scientists to evaluate the color of the soil precisely. Unless indicated otherwise, the colors given in the following descriptions are for the soils when moist.

Many terms used in the soil descriptions and other sections of the survey are defined in the Glossary.

Alluvial Land

Alluvial land (Am) consists of recent alluvium so variable in texture and drainage that classifying the material by soil series is not practical at the map scale used. Within short distances the texture ranges from silt loam to coarse sand. Some areas are well drained or moderately well drained, but others, cut by old stream channels, are poorly drained or very poorly drained.

Alluvial land occurs in scattered areas along rivers and other streams in the county, and it is subject to flooding. Much of the acreage is forested, but some is in pasture and some is idle. Unimproved pasture furnishes fair grazing in dry periods. Where it is feasible to improve drainage or straighten stream channels, the land can be used for improved pasture, hay crops, and some kinds of cultivated crops. (Capability unit IIIw-2; woodland suitability group 4; urban group 13)

Amenia Series

The Amenia series is made up of moderately well drained soils that developed in firm to very firm, calcareous glacial till of Late Wisconsin age. The till was derived mainly from limestone and Salisbury schist, but in places it contains varying amounts of quartzite, gneiss, and dolomite. These soils are in the northwestern part of the county, principally in the towns of Salisbury, Sharon, North Canaan, and Canaan. They occur on drumlins or drumloidal hills, generally downslope from the well-drained Stockbridge soils.

A typical profile in a cultivated area has a plow layer of very dark grayish-brown silt loam 10 inches thick. The subsoil is loam that is olive brown in the upper part but grades to olive mottled with olive gray and dark brown in the lower part. This layer extends to a depth of about 26 inches. The substratum is firm or very firm gravelly loam that is distinctly mottled in the upper part and is calcareous.

These soils are moderately permeable in the surface layer and subsoil but are slowly or very slowly permeable in the substratum. Their available moisture capacity is high.

Typical profile of Amenia silt loam, 0 to 3 percent slopes, in a hayfield about 1 mile north of the village of Sharon:

Ap—0 to 10 inches, very dark grayish-brown (10YR 3/2) silt loam; weak, medium, granular structure; friable; numerous roots; coarse fragments about 5 percent; mildly alkaline; abrupt, smooth boundary.

B21—10 to 16 inches, olive-brown (2.5Y 4/4) loam; a few spots of dark grayish brown (2.5Y 4/2); weak, medium, subangular blocky structure; friable; numerous roots; coarse fragments about 5 percent; mildly alkaline; clear, wavy boundary.

B22—16 to 26 inches, olive (5Y 5/3) loam; fine, olive-gray (5Y 5/2) and dark-brown (10YR 3/3) mottles; very weak, medium, subangular blocky structure; friable; roots common; coarse fragments about 10 percent; mildly alkaline; base saturation 100 percent; clear, wavy boundary.

C1—26 to 36 inches, olive (5Y 5/3) gravelly loam; common mottles of olive brown (2.5Y 4/4), yellowish brown (10YR 5/6), and olive gray (5Y 5/2); weak, thick, platy structure; firm or very firm; few roots; coarse fragments about 20 percent; calcareous; clear, wavy boundary.

C2—36 to 48 inches, color and texture same as C1 horizon, but consistence is firm; very few roots; coarse fragments about 20 percent; calcareous.

The B horizon is loam or silt loam, and the content of coarse fragments in this horizon ranges from 5 to 15 percent. The thickness of the solum generally is 24 to 26 inches but ranges from 20 to 32 inches. Typically, the B horizon is medium acid to mildly alkaline in the upper part and is neutral or mildly alkaline in the lower part. The depth to carbonate ranges from 20 to 30 inches.

The Ap horizon normally is very dark grayish brown (10YR 3/2) but in places is dark gray (10YR 4/1) or very dark gray (10YR 3/1). The hue of the B21 horizon generally is 2.5Y but ranges to 10YR; the value is 4 or 5 and the chroma is 3 or 4. In the B22 horizon the matrix has a hue of 2.5Y to 5Y. The C horizon has a few mottles with a value of 5 or 6, a chroma of 6, and a hue of 10YR or 7.5YR. In some places the B22 horizon contains limestone ghosts having colors of yellowish brown (10YR 5/4–5/6) or very pale brown (10YR 7/3–7/4). In places there are weathered fragments of dolomitic limestone colored neutral (N 5/0). In the C horizon the structure is generally thick, platy and the consistence is firm or very firm.

The Amenia soils are in the same drainage sequence as the well-drained Stockbridge soils, the poorly drained Kendaia soils, and the very poorly drained Lyons soils. They also occur near the Farmington soils, which are shallow to bedrock, and the well-drained Dover soils. The Amenia soils are moderately well drained like the Woodbridge soils, but they are less acid than those soils. In addition, the Amenia soils have a loam or silt loam solum and developed in till derived mainly from limestone and schist, whereas the Woodbridge soils have a fine sandy loam solum and developed in till derived mainly from schist.

Amenia silt loam, 0 to 3 percent slopes (AnA).—This soil has the profile described as typical for the series. Internal drainage is affected by a seasonal perched water table, which restricts water movement in winter and early in spring. Consequently, the soil dries out slowly in spring.

Some of the acreage is in cutover forest, but a large part of it has been cleared and is used for hay, pasture, and cultivated crops. The soil is suited to plants grown for hay or pasture and is fairly well suited to corn for silage or grain and to small grains. Alfalfa is subject to frost heave and should not be seeded alone. Improved drainage favors the growth of alfalfa and row crops. (Capability unit IIw–2; woodland suitability group 1; urban group 9)

Amenia silt loam, 3 to 8 percent slopes (AnB).—This gently sloping soil has better surface drainage than Amenia silt loam, 0 to 3 percent slopes, but its use and suitability are about the same as those of that soil. Erosion is a hazard if clean-cultivated crops are grown. Soil losses can be controlled by using graded stripcropping and diversion terraces. Where the soil can be drained, its suitability is improved for alfalfa and general farm crops. (Capability unit IIwe–2; woodland suitability group 1; urban group 9)

Amenia silt loam, 8 to 15 percent slopes (AnC).—This soil is more susceptible to erosion than more gently sloping Amenia soils. Included with it in mapping are small eroded areas.

Because this soil has a seasonal perched water table, it dries out slowly and warms up late in spring. Draining entire fields is impractical because of slope, but seep spots can be drained. The soil is suited to plants grown for hay or pasture, and a small acreage is used for silage corn and small grains. Moisture-tolerant grasses and legumes grow well, though alfalfa is subject to frost heaving and does poorly after a few years. (Capability unit IIIew–2; woodland suitability group 1; urban group 9)

Amenia stony silt loam, 3 to 8 percent slopes (AoB).—Stones limit the use of this soil for crops that require intensive cultivation. Areas mapped as this soil include small areas where slopes are 0 to 3 percent.

This soil is mainly in cutover forest, but some areas have been cleared. The cleared areas are used chiefly for pasture or hay, though some are idle. Hay crops, improved pasture, and small grains are among the suitable crops. Supplementary drainage is desirable for alfalfa and orchards but is not needed for moisture-tolerant grasses and legumes. (Capability unit IVws–2; woodland suitability group 1; urban group 9)

Amenia stony silt loam, 8 to 15 percent slopes (AoC).—This soil occupies only a small acreage. Some of it has been cleared and is used mainly for pasture; some is wooded. Controlling runoff is of greater concern on this soil than it is on more gently sloping Amenia stony silt loams. Because it is stony, the soil is not suited to row crops. It can be used for hay, improved pasture, and small grains. It is not a good soil for alfalfa, but it is suited to moisture-tolerant grasses and legumes grown for hay and pasture. It also is suited to trees and wildlife habitat. (Capability unit IVws–2; woodland suitability group 1; urban group 9)

Amenia very stony silt loam, 3 to 15 percent slopes (ApC).—Included with this soil in mapping are small scattered areas of soils having slopes of 0 to 3 percent.

Most of this soil is forested. Small areas have been cleared and are used for unimproved pasture or are idle. Because the surface layer is so stony, the soil is unsuitable for row cropping. It is suitable for woodland, unimproved pasture, and wildlife habitat. (Capability unit VIs–2; woodland suitability group 7; urban group 9)

Au Gres Series

In the Au Gres series are poorly drained soils that developed in deposits of acid loamy sand and sand. These soils occur in small areas on terraces.

A typical profile in a forest of hemlock and red maple has a surface layer of black loamy fine sand about 1 inch thick. Covering this layer is fresh leaf litter and humus. Just below the surface layer is a subsurface layer of gray loamy fine sand or fine sand 5 inches thick. Next is a dark reddish-gray to reddish-brown, slightly cemented layer that shows some humus and iron stains and is hard when dry. This gradually grades to loose, yellowish-brown and light olive-brown sand in the lower subsoil. The substratum begins at a depth of about 30 inches and is grayish-brown to light olive-gray sand that contains a few, distinct mottles.

The Au Gres soils have moderately rapid or rapid permeability and low available moisture capacity. Runoff is slow or seasonally ponded.

Typical profile of Au Gres loamy fine sand in an undisturbed area of hemlock and red maple, 800 feet east of Duck Pond on Mattatuck Trail Road, White Memorial Foundation, town of Litchfield:

O1—4 to 3 inches, fresh litter consisting of leaves and twigs from a mature and undisturbed stand of hemlock and red maple.

O2—3 inches to 0, humus layer mottled with fine roots and some medium roots.

A1—0 to 1 inch, black (5YR 2/1) loamy fine sand that is very rich in organic matter; very weak, medium, granular structure; very friable; numerous fine roots; extremely acid (pH 3.8); abrupt, wavy boundary.

A2—1 inch to 6 inches, gray (5YR 5/1) loamy fine sand or fine sand; structureless (massive, but is easily crushed to single grain); very friable; few fine and medium roots; extremely acid (pH 4.2); clear, wavy boundary.

B21h—6 to 12 inches, dark reddish-gray (5YR 4/2) loamy fine sand; dark reddish-brown (5YR 3/2) and reddish-brown (5YR 4/4) stains; structureless (massive, but is easily crushed to single grain); very weakly cemented; friable; few fine and medium roots; very strongly acid (pH 4.6); gradual, wavy boundary.

B22hir—12 to 17 inches, reddish-brown (5YR 4/4) loamy fine sand; ped surfaces stained with dark reddish brown (5YR 3/2 and 2/2); structureless (massive); weakly cemented; firm; no roots observed; very strongly acid; gradual, wavy boundary.

B31—17 to 20 inches, dark grayish-brown (10YR 4/2) loamy fine sand; with common, distinct, medium and coarse mottles and stains of dark brown (7.5YR 3/2) and dark reddish brown (5YR 3/3); weakly cemented; structureless (massive); firm in place; strongly acid; gradual, wavy boundary.

B32—20 to 23 inches, yellowish-brown (10YR 5/4) sand; mottles of strong brown (7.5YR 5/6) and light yellowish brown (10YR 6/4); easily crushed to single grain; slightly firm in place; strongly acid; gradual, wavy boundary.

B33—23 to 30 inches, light olive-brown (2.5Y 5/4) sand; common, medium, distinct mottles of strong brown (7.5YR 5/6) and light yellowish brown (10YR 6/4); easily crushed to single grain; strongly acid; gradual, wavy boundary.

C—30 to 60 inches, grayish-brown (2.5Y 5/2) to light olive-gray (5Y 6/2) medium and fine sand; few, medium, distinct mottles of dark yellowish brown (10YR 4/4); structureless (single grain); loose; strongly acid.

The texture of the A1 horizon is generally loamy fine sand, but this material contains a large amount of humus from the overlying 02 layer. Below the A1 horizon, the texture is loamy fine sand, loamy sand, or sand. The lower part of the B horizon and the C horizon generally are medium or fine sand, but in places the C horizon includes some coarse sand. The A1 horizon is missing in some places, and here an A2 horizon is just below the 02 layer. In the A2 horizon there are individual grains of sand that stand out prominently when the horizon is dry. The A2 horizon has a hue ranging from 10YR to 5YR, a value of 5 to 7, and a chroma of 1 to 2; or it has a hue of 7.5YR, a value of 6 to 7, and a chroma of 0 to 2.

The Bh horizon is darker colored than the overlying horizon, and it shows stains or blotches of iron and discolorations of humus. It is friable to firm. The hue is 5YR to 7.5YR, the value is 3 to 4, and the chroma is 2 to 4. Mottles and stains are somewhat brighter or darker colored but have the same hue. The lower part of the B horizon and the C horizon have hues ranging from 10YR to 2.5Y, a value of 5 to 7, and a chroma of 2 or 3.

The Au Gres soils are near the very poorly drained Scarboro soils, which developed on sandy and gravelly materials, and the very poorly drained Birdsall soils, which developed mainly in medium-textured sediments. Au Gres soils have a coarser textured solum than the poorly drained Walpole soils, and the iron- and humus-stained layer that occurs in the Au Gres soils is lacking in the Walpole soils.

Au Gres loamy fine sand (Au).—This soil occurs only in areas of wet sandy sediments. Small areas have been cleared and are pastured. If the soil is partly drained, it can be used for improved pasture. Liming and fertilizing will increase the growth of native grasses and legumes. Undrained, the soil is suitable for woodland, unimproved pasture, and wildlife habitat. (Capability unit IIIw–1; woodland suitability group 4; urban group 11)

Belgrade Series

The Belgrade series consists of nearly level and gently sloping, moderately well drained soils that developed in deep silt and very fine sand. Typically, these soils are free of coarse fragments to a depth of 40 inches or more. They occupy scattered areas in valleys of the county.

A typical profile in a cultivated field has a surface layer of very friable, dark-brown silt loam 8 inches thick. The subsoil is made up of light olive-brown silt loam that extends to a depth of 32 inches. In the lower part the subsoil is mottled with olive gray and yellowish brown. The substratum is pale-olive silt loam that contains fewer mottles than the lower subsoil and includes lenses of very fine sandy loam and fine sand.

These soils are moderately permeable, are friable or very friable throughout, and have high available moisture capacity. In places the water table rises to within 15 to 20 inches of the surface in wet periods.

Typical profile of Belgrade silt loam, 0 to 3 percent slopes, in an idle field about 1½ miles east of the village of East Canaan in North Canaan:

Ap—0 to 8 inches, dark-brown (10YR 3/3) silt loam; weak, coarse, granular structure; very friable; medium acid; abrupt, wavy boundary.

B21—8 to 14 inches, light olive-brown (2.5Y 5/6) silt loam, yellowish brown (10YR 5/6) when crushed; very weak, coarse, subangular blocky structure; friable; medium acid; clear, wavy boundary.

B22—14 to 18 inches, light olive-brown (2.5Y 5/4) silt loam; weak, medium, subangular blocky structure; friable; medium acid; clear, wavy boundary.

B23—18 to 32 inches, light olive-brown (2.5Y 5/4) silt loam; common, medium, distinct mottles of olive gray (5Y 5/2) and yellowish brown (10YR 5/6–5/8); very weak, medium, platy structure; very friable; medium acid; clear, wavy boundary.

C—32 to 42 inches, pale-olive (5Y 6/3) silt loam; few fine mottles of light olive brown (2.5Y 5/4) and olive gray (5Y 5/2); lenses of very fine sandy loam and fine sand; varied or moderate, medium, platy structure; firm; medium acid.

The texture in the upper part of the B horizon is dominantly silt loam but grades to very fine sandy loam in places. Below a depth of 24 to 36 inches, lenses of loamy fine sand and fine sand are common and a few lenses of silty clay loam occur. The profile is essentially free of coarse fragments to a depth of 40 inches, but it may contain some thin lenses of coarse sand or sand and gravel. The solum generally is strongly acid to medium acid. In the northwestern part of the county, however, in places where the soils occur near the limestone valley, the lower part of the profile may be slightly acid. The thickness of the solum ranges from 24 to 36 inches.

The color of the Ap horizon ranges from very dark grayish brown (10YR 3/2) to brown (10YR 4/3). The color of the B21 horizon is normally 2.5Y to 7.5Y in hue, 4 to 5 in value, and 3 to 6 in chroma. The lower part of the B horizon has a matrix hue of 5Y, 2.5Y, or 10YR. Mottles are 2.5Y, 5Y, or 10YR in hue; the chroma is 1 to 6, and the value is 5 to 7. The depth to mottles ranges from 14 to 20 inches.

The Belgrade soils are near the well-drained Hartland soils, the poorly drained Raynham soils, and the very poorly drained Birdsall soils. They also are associated with the moderately well drained Tisbury and Sudbury soils. Belgrade soils are similar in texture to the Tisbury soils, but they lack the coarse sand and gravel that underlie those soils at a depth of about 2 feet. In contrast to the Belgrade soils, Sudbury soils are moderately coarse textured in the solum and are underlain by sand and gravel.

Belgrade silt loam, 0 to 3 percent slopes (BaA).—This soil has the profile described as typical for the series. It occurs in areas where runoff is medium to slow. A seasonal high water table restricts internal drainage, and the soil dries out rather slowly in spring. It is free of surface stones and is easy to work.

This soil occupies only a small acreage. Some of it has been cleared and is used for hay, pasture, and silage corn. In addition, some is forested and some is idle. Undrained, the soil is suitable for pasture, hay, silage corn, birdsfoot trefoil, sudangrass, and millet. Drained areas can be used for alfalfa and some kinds of cultivated crops. (Capability unit IIw–1; woodland suitability group 1; urban group 8)

Belgrade silt loam, 3 to 8 percent slopes (BaB).—This soil has medium runoff and, in winter and spring, is susceptible to erosion if it is clean tilled and not protected. Some of the acreage is forested, and some has been cleared and is idle or is used for hay, pasture, or silage corn. The soil is suitable for about the same crops as Belgrade silt loam, 0 to 3 percent slopes. Simple practices are needed for controlling erosion in cultivated areas. (Capability unit IIwe–1; woodland suitability group 1; urban group 8)

Bernardston Series

The Bernardston series consists of well-drained soils that have a slowly or very slowly permeable pan at a depth of about 2 feet. The layers above the pan are friable, are moderately permeable, and have high available moisture capacity. These soils are on glacial uplands in the northwestern part of the county, mainly in the town of Salisbury. Most of their acreage lies in the vicinity of Riga Mountain and directly south of it. In some areas the soils are gently sloping and occur on low drumloidal hills; in others they are hilly or steep. The soils are inextensive and are of little importance to farming.

A typical profile in a cultivated field has an 8-inch plow layer of friable, dark-brown silt loam. The upper part of the subsoil is yellowish-brown silt loam, and the lower part is light olive-brown to olive channery silt loam. At a depth of 26 inches is a compact layer, or pan, made up of olive-brown to light olive-brown channery silt loam.

The stony Bernardston soils on Riga Mountain contain a somewhat larger amount of gravel and channery fragments than soils of this series in lower areas to the south. The pebbles and channery fragments vary in size and consist of flat, smooth, oblong pieces of Salisbury schist.

Typical profile of Bernardston silt loam, 3 to 8 percent slopes, in a hayfield on Sellick Hill Road, one-fourth mile east of the intersection of Sellick Hill Road and Lincoln City Road in Salisbury:

Ap—0 to 8 inches, dark-brown (10YR 3/3) silt loam; weak, fine, granular structure; friable; numerous fine roots; coarse fragments about 15 percent; medium acid; clear, smooth boundary.

B21—8 to 14 inches, yellowish-brown (10YR 5/4) silt loam; weak, medium, subangular blocky structure; friable; few fine roots; coarse fragments about 15 percent; strongly acid; gradual, wavy boundary.

B22—14 to 24 inches, light olive-brown (2.5Y 5/4) channery silt loam; weak, medium, subangular blocky structure; friable; few fine roots; coarse fragments about 25 percent; very strongly acid; gradual, wavy boundary.

B3—24 to 26 inches, light olive-brown (2.5Y 5/4) to olive (5Y 5/3) channery silt loam; weak, thick, platy structure; firm in place; no roots observed; coarse fragments about 25 percent; very strongly acid; clear, wavy boundary.

Cx—26 to 42 inches, olive-brown (2.5Y 4/4) to light olive-brown (2.5Y 5/4) channery silt loam; weak, thick, platy structure; very firm; no roots observed; coarse fragments about 30 percent; very strongly acid. Coarse fragments in the profile consist primarily of Salisbury schist.

The texture of the B and C horizons is generally silt loam, but in some places it is loam. The depth to the Cx horizon, or fragipan, ranges from 20 to 28 inches. Structure normally is subangular blocky in the B2 horizon but grades to very weak, thick, platy in the B3 horizon and to weak, thick, platy in the C horizon.

The color of the Ap horizon generally is dark brown (10YR 3/3) or very dark grayish brown (10YR 3/2). The hue in the upper part of the B horizon is 10YR, the value is 3 through 5, and the chroma is 4 through 6. In the lower B horizon the hue is 2.5Y or 5Y, the value is 3 through 5, and the chroma is 2 through 4. The Cx horizon has a hue ranging from 2.5Y through 5Y. A few faint mottles occur along the area of contact between the B and C horizons. The profile is medium acid to very strongly acid.

The Bernardston soils occur most commonly near the Hollis soils, which are shallow to bedrock. They also are near the well drained Stockbridge soils and the moderately well drained Amenia soils, all of which developed in material derived from limestone and schist.

Bernardston silt loam, 3 to 8 percent slopes (BqB).—This soil has the profile described as typical for the series. Because it has a compact layer at a depth of about 2 feet, the soil generally is waterlogged early in spring and dries out slowly. If the growing season is normal, however, moisture is usually adequate for crops. Included with this soil in mapping are small areas where slopes are 0 to 3 percent.

Most of this soil has been cleared and is used for crops in support of dairying or is idle. The soil is suited to corn for silage or grain, small grains, millet, sudangrass, hay, and pasture. Alfalfa should not be seeded alone but in mixture with grass, for it is subject to frost heave and runs out after several years. Where the soil is cultivated, practices are needed that control erosion and maintain good tilth. (Capability unit IIe-2; woodland suitability group 2; urban group 5)

Bernardston silt loam, 8 to 15 percent slopes (BqC).—This soil has more rapid runoff and, if unprotected, is subject to greater erosion than more gently sloping Bernardston soils. Included in mapping are small eroded areas; small areas in which the slopes are 15 to 25 percent; and small areas of soils having a compact layer, or pan, at a depth exceeding 28 inches.

This soil is used in much the same way as Bernardston silt loam, 3 to 8 percent slopes, and it is suited to about the same crops. Because of stronger slopes, however, practices for controlling erosion need to be more carefully applied. (Capability unit IIIe-2; woodland suitability group 2; urban group 6)

Bernardston stony silt loam, 3 to 8 percent slopes (BuB).—This soil has a stony surface layer, but in other respects its profile is similar to the one described as typical for the series. Included in mapping are small scattered areas in which a compact layer occurs at a depth of more than 28 inches.

Although some of this soil has been cleared and is used for pasture, much of it is in cutover forest. Trees, improved pasture, hay, and small grains are suitable crops. Using farm machinery is somewhat difficult because of stones. (Capability unit IVes-2; woodland suitability group 2; urban group 5)

Bernardston stony silt loam, 8 to 15 percent slopes (BuC).—Controlling runoff is more difficult on this soil than on Bernardston stony soils having milder slopes. Surface stones interfere with normal cultivation, but hay and improved pasture can be grown. Row cropping is limited by stoniness. Other suitable uses are woodland, wildlife habitat, and recreation. Included in areas mapped as this soil are small areas of soils that have slopes of 15 to 25 percent. (Capability unit IVes-2; woodland suitability group 2; urban group 6)

Bernardston very stony silt loam, 3 to 15 percent slopes (BwC).—This soil is mainly in forest, a good use. Some areas have been cleared and are used mainly for unimproved pasture or are idle. The soil is so stony that it is unsuitable for cultivation, but in some areas it can be worked for improved pasture or orchards. The growth of forage plants in unimproved pasture can be increased by fertilizing and controlling brush. (Capability unit VIs-2; woodland suitability group 7; urban group 6)

Bernardston very stony silt loam, 15 to 25 percent slopes (BwD).—This soil is largely in forest, though scattered areas have been cleared and are used for unimproved pasture or are idle. Because of stones and steep slopes, use is generally limited to woodland, grazing, and wildlife habitat. (Capability unit VIIs-2; woodland suitability group 8; urban group 7)

Birdsall Series

In the Birdsall series are level or slightly depressional, nonacid, very poorly drained soils that developed in waterlaid or windblown deposits of silt and very fine sand. These soils occupy small areas in the valleys and, to a limited extent, in the uplands. They have a water table at or near the surface in winter and spring. Their permeability is moderate, and their available moisture capacity is high.

A typical profile has a surface layer of very dark gray silt loam about 9 inches thick. This layer is covered with fresh and decomposed litter. The subsoil is olive-gray to light olive-gray silt loam that grades with depth to gray, strongly mottled silt loam. Underlying the subsoil is gray silt loam.

Typical profile of Birdsall silt loam in a forested area on New Pitch Road, one-half mile east of the intersection of this road and Connecticut Route 63 in the town of Litchfield:

O1—3 to 2 inches, recent raw litter from deciduous trees.

O2—2 inches to 0, mat of decomposed and partly decomposed litter.

A1—0 to 9 inches, very dark gray (10YR 3/1) silt loam; weak, medium, granular structure in the upper part, grading to weak, medium, subangular blocky structure in the lower part; friable; some fine roots; strongly acid; gradual, wavy boundary.

B21—9 to 18 inches, olive-gray (5Y 5/2) to light olive-gray (5Y 6/2) silt loam; few, fine, faint mottles of dark yellowish brown (10YR 4/4); weak, medium, subangular blocky structure; slightly firm in place; no roots observed; medium acid; gradual, wavy boundary.

B22g—18 to 26 inches, gray (5Y 6/1) silt loam; common, medium prominent mottles of gray (5Y 5/1), strong brown (7.5YR 5/6), and dark brown (7.5YR 4/4); weak, thick, platy structure; slightly firm in place but friable when removed; no roots observed; medium acid; gradual, wavy boundary.

Cg—26 to 46 inches, gray (5Y 6/1) silt loam; common, medium, distinct mottles of gray (5Y 6/1); structureless (massive); slightly firm in place; medium acid; numerous fine mica flakes.

In some places below a depth of 20 to 24 inches, silt loam grades to very fine sandy loam. In places the C horizon contains thin lenses of sand, fine gravel, or gravel and coarse sand. This horizon may also contain thin lenses of silty clay loam, but the overall clay content in the C horizon does not exceed 18 percent. Below a depth of 40 inches, the material is variable. In some places it is silt loam or very fine sandy loam, but in others it grades to glaciofluvial deposits of coarse materials.

The color of the A horizon is black (10YR 2/1) to very dark gray (10YR 3/1). In the B horizon the color of the matrix is 2.5Y to 5Y in hue, 4 to 6 in value, and 1 to 2 in chroma. Generally, the B21 horizon is less mottled than the B22g horizon. The upper part of the solum normally is friable, but in some places the lower part is firm and has weak platy structure.

The Birdsall soils are in the same drainage sequence as the well drained Hartland soils, the moderately well drained Belgrade soils, and the poorly drained Raynham soils, and they occur closely with all of those soils. They also occur near the moderately coarse textured Whitman soils, which developed in moderately coarse textured glacial till. The Birdsall soils are similar to the Saco soils in texture, but the Saco soils developed in medium-textured alluvium.

Birdsall silt loam (Bz).—This level or slightly depressional soil has slow runoff. Included in mapping are small scattered areas in which the lower horizons contain lenses of material that is finer textured than silt loam. Also included are scattered areas where the depth to sand and gravel is 24 to 30 inches.

This soil is inextensive and not important to farming. Most of it is forested, but some areas have been cleared and are used for unimproved pasture or are idle. Providing adequate drainage is impractical in many areas because outlets are lacking. In places open ditches can be used to drain the soil sufficiently for improved pasture. Other suitable uses are woodland and wildlife habitat. (Capability unit Vw-1; woodland suitability group 5; urban group 12)

Borrow and Fill Land

Borrow and fill land consists of areas where the original soil has been disturbed or removed during the construction of highways, dams, reservoirs, and industrial and housing developments. These areas generally are not suitable for cultivation, but some of them can be either reforested or graded, limed and fertilized, and seeded to grasses and legumes. Each site should be investigated to determine its suitability.

Borrow and fill land, coarse material (Bk) is made up of borrow areas and cut and fill material over sand and gravel or coarse glacial till. Generally, the soil horizons above the underlying material have been obliterated or taken away. In places the underlying material also has been disturbed. Except in small areas on flood plains, this land is extremely droughty. It occurs most commonly in areas of Copake, Enfield, Groton, Hinckley, and Merrimac soils. (Woodland suitability group 11; capability unit and urban group not assigned)

Borrow and fill land, loamy material (Bl) consists of borrow areas and cut and fill material over loamy materials. Generally, it occurs in areas of soils that formed in glacial till and range from fine sandy loam to silt loam in texture. This land is in small to fairly large tracts throughout the county. It varies in permeability, drainage, and suitability for vegetation. (Woodland suitability group 11; capability unit and urban group not assigned)

Branford Series

In the Branford series are loamy, well-drained soils that developed in stratified sand and gravel of Late Wisconsin age. The stratified material consisted mainly of reddish-brown Triassic sandstone but included a variable amount of basalt and coarse crystalline rocks such as gneiss. These soils are of limited acreage and distribution; they occur only in the southern part of the town of Woodbury.

A typical profile in a wooded area has a surface layer of dark-brown loam that is about 1 inch thick and is underlain by a former plow layer of dark-brown loam about 7 inches thick. Next is a loam subsoil that is reddish brown in the upper part but is slightly lighter colored with depth. The substratum, at a depth of about 26 inches, is yellowish-red coarse sand and gravel. It is loose, stratified, and cobbly in places.

The Branford soils are moderately permeable in the surface layer and subsoil and are very rapidly permeable in the substratum. Their available moisture capacity is high.

Typical profile of Branford loam, 3 to 8 percent slopes, in a wooded area 500 feet south of the intersection of Bacon Pond Road and Orenaug Pond Road, town of Woodbury:

O1 and O2—1½ inches to 0, fresh decomposed and partly decomposed litter.

A1—0 to 1 inch, dark-brown (10YR 3/3) loam; very weak, fine, granular structure; very friable; numerous fine roots; coarse fragments about 2 percent; very strongly acid; clear, wavy boundary.

Ap—1 inch to 8 inches, dark-brown (7.5YR 3/2) loam; very weak, medium, granular structure; very friable; numerous fine roots; coarse fragments about 5 percent; very strongly acid; clear, smooth boundary.

B21—8 to 16 inches, reddish-brown (5YR 4/4) loam; very weak, subangular blocky structure; friable; some fine roots; coarse fragments about 10 percent; very strongly acid; gradual, wavy boundary.

B22—16 to 26 inches, reddish-brown (5YR 4/4) loam that is somewhat gritty at the lower boundary; very weak, subangular blocky structure; friable; few fine roots; coarse fragments about 10 percent in upper part, but increasing to about 15 percent with depth; very strongly acid; abrupt, wavy boundary.

IIC—26 to 40 inches, yellowish-red (5YR 4/6) sand and gravel; structureless; loose; no roots observed; coarse fragments about 40 percent; these fragments consist of basalt, gneiss, and some reddish sandstone; very strongly acid.

The texture of the B horizon is dominantly loam, though in places it is silt loam. The content of coarse fragments in the solum generally ranges from 5 to 20 percent, but in some places it is more than 20 percent in the lower part of the subsoil. In the C horizon the gravel content ranges from 35 to 65 percent. The depth to sand and gravel is 20 to 30 inches, and the average depth is about 24 inches.

The A1, or Ap, horizon has a hue of 5YR, 7.5YR, or 10YR; a value of 3 or 4; and a chroma of 2 to 4. In the B horizon the hue is 5YR, the value is 4 to 5, and the chroma is 4 to 6.

The Branford soils are finer textured than the Merrimac soils. Unlike the Branford soils, the Merrimac soils have a hue of 7.5YR or yellower in the subsoil and were derived chiefly from granite, gneiss, and schist. Differences in color and parent material separate the Branford soils from the Enfield soils, which developed in a silt mantle of 7.5YR to 10YR hue over stratified sand and gravel.

Branford loam, 3 to 8 percent slopes (BoB).—This soil has the profile described as typical for the series. Included in mapping are small scattered areas of Enfield soils and small areas in which the depth to sand and gravel is 18 inches or less.

Some areas of this soil are in cutover forest, some are in housing developments, and others are idle. Only a small acreage is in crops, principally those grown for hay and pasture. The soil is well suited to general farm crops, including silage corn, alfalfa, and grass. It warms up rapidly in spring, is free or nearly free of stones, and is easily worked. The response to fertilizer and lime is good. Surface runoff is not a serious hazard, but unprotected areas are subject to slight sheet erosion. (Capability unit IIe-1; woodland suitability group 2; urban group 1)

Branford loam, 8 to 15 percent slopes (BoC).—This soil is sloping or gently rolling. Included with it in mapping are scattered areas of Enfield soils and small areas of soils in which sand and gravel are less than 18 inches below the surface.

This soil is mainly in cutover forest. Some areas are in housing developments or small estates, and some are idle. Only a small acreage is used for pasture or hay. The soil is friable and responds well to good management. However, it has more rapid runoff than Branford loam, 3 to 8 percent slopes, and it needs more intensive practices for controlling erosion. Other measures needed are those that conserve moisture, provide regular additions of organic matter, and maintain fertility. (Capability unit IIIe-1; woodland suitability group 2; urban group 2)

Charlton Series

The Charlton series consists of deep, well-drained, nearly level or undulating to hilly soils that developed in friable to firm glacial till. The till was derived mainly from schistose rocks, but to some extent, from granite and gneiss. These soils are well distributed on uplands throughout the county. They are stony or very stony on about two-thirds of their total acreage. Permeability is moderate to moderately rapid in the surface layer and subsoil.

A typical profile in an undisturbed forested area has a surface layer of dark-brown fine sandy loam about 2 inches thick. The subsoil is fine sandy loam that is very friable and dark brown or dark yellowish brown in the upper part and is firm and yellowish brown in the lower part. This layer extends to a depth of 30 inches. It is underlain by light olive-brown, friable to firm material that varies in texture but generally is gravelly sandy loam or loamy sand. Small angular fragments of rock are common throughout the profile.

Nonstony Charlton soils are used for row crops and for hay and pasture in support of dairying. The stony and very stony soils are mainly in cutover forest or pasture or are idle.

Typical profile of Charlton very stony fine sandy loam, 3 to 15 percent slopes, in a wooded area in the town of Winchester, three-fourths mile southeast of Silas Hall Pond:

O1—1½ inches to 1 inch, raw litter from hardwoods and some white pine and hemlock.

O2—1 inch to 0, decomposed and partly decomposed litter of leaves and twigs.

A1—0 to 2 inches, dark-brown (10YR 3/3) fine sandy loam; very weak, medium, granular structure; friable; numerous fine roots; coarse fragments about 2 percent; very strongly acid; clear, wavy boundary.

B21—2 to 17 inches, dark-brown (7.5YR 4/4) fine sandy loam; very weak, medium, subangular blocky structure; very friable; few fine roots; coarse fragments about 10 percent; very strongly acid; gradual, wavy boundary.

B22—17 to 26 inches, dark yellowish-brown (10YR 4/4) fine sandy loam; structureless (massive) but breaks into soft clods when disturbed; very friable; few fine roots; coarse fragments about 15 percent; medium acid; gradual, wavy boundary.

B3—26 to 30 inches, yellowish-brown (10YR 5/4) fine sandy loam; structureless (massive) but breaks into soft subangular clods when disturbed; firm in place; few fine roots; coarse fragments about 15 percent; medium acid; gradual, wavy boundary.

C—30 to 42 inches light olive-brown (2.5YR 5/4) gravelly sandy loam with lenses of gravelly loamy sand; structureless (massive); slightly firm in place; numerous fragments of schist and granite and mica flakes; medium acid.

The A horizon is fine sandy loam, stony fine sandy loam, or very stony fine sandy loam. The C horizon is dominantly gravelly fine sandy loam or gravelly sandy loam, but in many places it includes lenses of strata of loamy sand or gravelly loamy sand 3 to 12 inches thick. The C horizon, to a depth of 3 feet or more, generally is very friable to firm, though very firm layers occur in places below 3 feet. In most places the thickness of the solum is about 24 to 30 inches, but thickness ranges from 18 to 30 inches.

The Ap horizon generally is very dark grayish brown (10YR 3/2) to dark brown (10YR 3/3). In the solum the brighter colors are in the upper part of the B horizon, where the hue is 10YR or 7.5YR. In the lower part, the hue is 10YR or 2.5Y. Throughout the B horizon, values ordinarily are 4 to 6 and chromas are 4 to 8. The C horizon generally has hues of 2.5Y and 5Y, values of 4 to 6, and chromas of 3 to 8.

The surface of these soils normally is stony or very stony, but some areas have been cleared of stones.

The Charlton soils are near the moderately well drained Sutton soils, the somewhat poorly drained to poorly drained Leicester soils, and the very poorly drained Whitman soils. They also occur near the Paxton and Hollis soils, and they are similar to them in texture and mineralogy. In contrast to the Charlton soils, however, the Paxton soils have a hard, compact layer at a depth of about 24 inches, and the Hollis soils are shallow to bedrock.

Charlton fine sandy loam, 0 to 3 percent slopes (CaA).—This inextensive soil occurs in small areas throughout the county. Except for its 4- to 8-inch plow layer that is essentially free of surface stones, its profile is similar to the one described as typical for the series. The moisture-holding capacity is moderate in the surface layer and subsoil. Runoff is only a slight hazard. Included in mapping are small scattered areas of soils having a silt loam surface layer and subsoil.

This soil is suited to general farm crops and is used mainly for silage corn, small grains, and hay crops. It is well suited to alfalfa. The soil is fairly easy to work, but in unlimed areas it is strongly acid and requires lime and fertilizer for a good growth of crops. (Capability unit I–1; woodland suitability group 2; urban group 3)

Charlton fine sandy loam, 3 to 8 percent slopes (CaB).—The profile of this soil is in most respects similar to that described as typical for the series, but its surface layer is free or nearly free of stones (fig. 6). Runoff is a hazard on this soil, and unprotected areas are subject to sheet and rill erosion. Included in mapping are small areas in which the surface layer and subsoil are silt loam. Also included, in the town of Woodbury, are small areas where the subsoil is reddish brown.

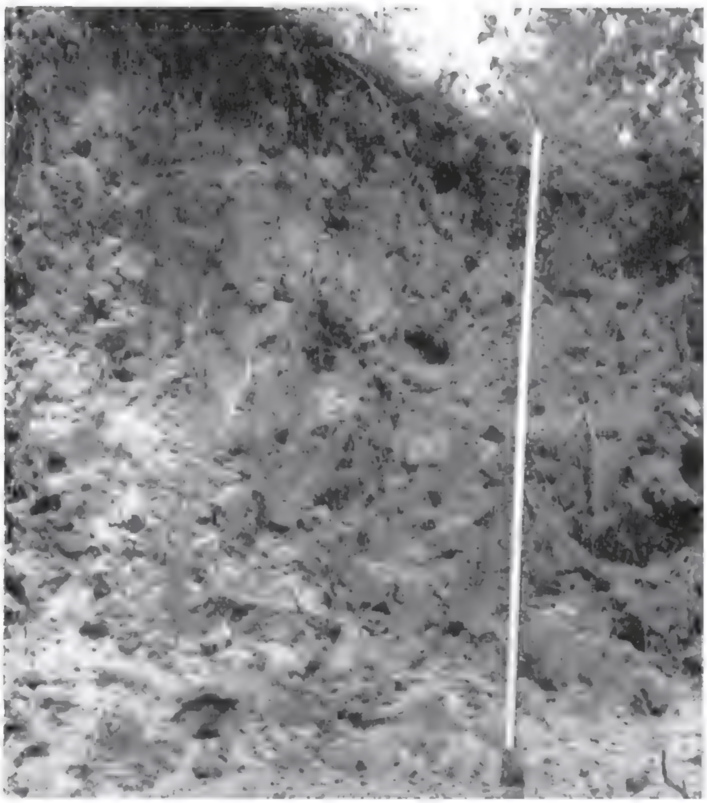

***Figure 6.*—Profile of a Charlton fine sandy loam.**

This soil is suited to general farm crops and is well suited to alfalfa and birdsfoot trefoil. It is used mainly for row crops, hay crops, and pasture, but in some places it is used for orchards. Easily applied practices reduce runoff and control erosion. (Capability unit IIe–1; woodland suitability group 2; urban group 3)

Charlton fine sandy loam, 3 to 8 percent slopes, eroded (CaB2).—This soil has a profile somewhat similar to the one described as typical for the series, but it is thinner in the surface layer and subsoil because of erosion. The combined thickness of these layers is only about 18 inches.

This soil is suited to general farm crops and is used chiefly for row crops, hay crops, and pasture. It produces a good growth of alfalfa and birdsfoot trefoil. The soil needs to be managed more carefully than Charlton fine sandy loam, 3 to 8 percent slopes. (Capability unit IIe–1; woodland suitability group 2; urban group 3)

Charlton fine sandy loam, 8 to 15 percent slopes (CaC).—This soil is more susceptible to erosion than less sloping Charlton soils. Included in mapping are small areas of soils that have a surface layer and subsoil of silt loam. Also included, in the towns of Woodbury and Roxbury, are small areas of soils having a reddish-brown subsoil.

This soil is well suited to grasses, alfalfa, and other legumes grown for hay or pasture, and to orchards. It also can be row cropped if soil losses are controlled. (Capability unit IIIe–1; woodland suitability group 2; urban group 4)

Charlton fine sandy loam, 8 to 15 percent slopes, eroded (CaC2).—This eroded soil has a profile somewhat similar to that described as typical for the series, but it is thinner in the surface layer and subsoil.

This soil is suited to general farm crops, including hay crops and pasture. Alfalfa and birdsfoot trefoil grow well. If clean-tilled crops are grown, suitable practices are needed for supplying organic matter and controlling erosion. Careful management is of greater concern on this soil than on Charlton fine sandy loam, 8 to 15 percent slopes. (Capability unit IIIe–1; woodland suitability group 2; urban group 4)

Charlton fine sandy loam, 15 to 25 percent slopes (CaD).—This strongly sloping soil occupies small areas scattered throughout the county. Included with it in mapping are small areas of eroded soils and small areas of reddish-brown soils.

Rapid runoff and a severe hazard of erosion make this soil generally unsuited to cultivated crops. The soil is suited to crops grown for hay and pasture and is used mainly for these purposes. Some cleared areas are idle. (Capability unit IVe–1; woodland suitability group 3; urban group 7)

Charlton fine sandy loam, 25 to 35 percent slopes (CaE).—This soil generally occurs in narrow strips on the sides of hills and is in scattered areas throughout the county. Included in mapping are small areas of eroded soils.

Because this steep soil is difficult to work with modern machinery, it is mainly in pasture and forest, uses to which it is well suited. (Capability unit VIe–1; woodland suitability group 3; urban group 7)

Charlton stony fine sandy loam, 3 to 8 percent slopes (ChB).—A large part of this soil is forested, but some has been cleared and is used for hay, pasture, and orchards. Some cleared areas are idle. The soil has stones on the surface that interfere somewhat with modern farm machinery. Nevertheless, it can be used for small grains and tree fruits and, if limed and fertilized, is suited to plants grown for pasture or hay. Included in mapping are small areas of soils having slopes of 0 to 3 percent, small scattered areas where the surface layer is silt loam, and small areas of soils in which the subsoil is reddish brown. (Capability unit IVes–1; woodland suitability group 2; urban group 3)

Charlton stony fine sandy loam, 8 to 15 percent slopes (ChC).—This soil has medium to rapid runoff and is more susceptible to erosion than less sloping Charlton soils. It

occurs throughout the county and is mainly forested, though in some areas it is used for hay, pasture, and orchards. (Capability unit IVes–1; woodland suitability group 2; urban group 4)

Charlton stony fine sandy loam, 15 to 25 percent slopes (ChD).—This inextensive soil is in areas scattered throughout the county, generally in long strips downslope from Hollis soils or very stony Charlton soils. Most of the soil is forested, but some areas are used for pasture or are idle. Forest and unimproved pasture are suitable uses. (Capability unit VIes–1; woodland suitability group 3; urban group 7)

Charlton very stony fine sandy loam, 3 to 15 percent slopes (CrC).—This undulating to rolling soil has the profile described as typical for the series. The soil occupies small to large areas and is fairly extensive throughout the county, except in the northwestern corner. Included in mapping are small areas in which the surface layer and subsoil are silt loam, and small areas of soils having a reddish-brown subsoil.

A large acreage of this soil is in forest, but some areas have been cleared and are used mainly for unimproved pasture or are idle. The soil is so stony that it is not suitable for cultivation, though in some areas it can be used for improved pasture. Other suitable uses are woodland and wildlife habitat. (Capability unit VIs–1; woodland suitability group 7; urban group 4)

Charlton very stony fine sandy loam, 15 to 35 percent slopes (CrD).—This soil is widely distributed in the county, except in the northwestern corner. Most of the acreage is wooded, but small areas have been cleared and are used for unimproved pasture or are idle. Trees, unimproved pasture, and wildlife habitat are among the suitable uses. (Capability unit VIIs–1; woodland suitability group 8; urban group 7)

Copake Series

The Copake series consists of nearly level to rolling, well-drained soils that developed in glaciofluvial deposits derived mainly from schist and limestone but partly from gneiss and dolomite. These soils lie on terraces in the northwestern part of the county and in the valley of the Housatonic River.

In a typical profile the surface layer is dark-brown loam about 8 inches thick. The subsoil is dark yellowish-brown very fine sandy loam in the upper part and grades to olive-brown gravelly fine sandy loam in the lower part. This layer extends to a depth of about 24 inches. The substratum is dark grayish-brown sand and gravel in which there are fragments of limestone.

The Copake soils are very friable. Their permeability is moderate in the surface layer and subsoil and is very rapid in the substratum. The soils warm up rapidly in spring and are easily worked.

Typical profile of Copake loam, 0 to 3 percent slopes, in a hayfield on Sharon Station Road, one-fourth mile west of Sharon Valley in the town of Sharon:

Ap—0 to 8 inches, dark-brown (10YR 3/3) loam; weak, medium, granular structure; very friable; numerous fine roots; coarse fragments about 12 percent; medium acid; clear, smooth boundary.

B21—8 to 16 inches, dark yellowish-brown (10YR 4/4) very fine sandy loam; weak, coarse, subangular blocky structure; friable; few fine roots; coarse fragments about 10 percent; slightly acid; clear, wavy boundary.

B22—16 to 24 inches, olive-brown (2.5Y 4/4) gravelly fine sandy loam; very weak, medium, subangular blocky structure; very friable; few fine roots; coarse fragments about 20 percent; slightly acid; clear, wavy boundary.

IIC—24 to 46 inches, dark grayish-brown (2.5Y 4/2) sand and gravel; yellow (10YR 7/6) limestone ghosts and gray (2.5Y 5/0) dolomitic ghosts; loose; no roots observed; coarse fragments more than 50 percent; calcareous; gravel is mainly from schist and limestone.

The content of coarse fragments in the A horizon ranges from 10 to 20 percent. The upper part of the B horizon is gravelly loam to fine sandy loam. Thickness of the solum generally is about 24 inches but ranges from 20 to 30 inches. In most places the depth to carbonates is about 30 inches, but depth varies from about 24 to more than 46 inches.

Color in the Ap horizon is 10YR or 2.5Y in hue, 3 to 4 in value, and 2 to 3 in chroma. The upper part of the B horizon has a hue of 10YR or 2.5Y, a value of 4 to 5, and a chroma of 4 to 6. The C horizon has a hue of 2.5Y or 5Y. Limestone ghosts are colored strong brown, yellowish brown, and gray.

The Copake soils are in the same drainage sequence as the excessively drained Groton soils, the moderately well drained Hero soils, and the poorly drained Fredon soils. They also occur near the Stockbridge, Dover, and Farmington soils. The Copake soils are finer textured than the Merrimac soils.

Copake loam, 0 to 3 percent slopes (CwA).—The profile of this soil is the one described as typical for the Copake series. The soil has moderate available moisture capacity.

Although scattered areas of this soil are in forest, most of the acreage has been cleared and is used for crops in support of dairying. The soil is easily worked and subject to little or no erosion. It is suited to many kinds of crops, including vegetables, sweet corn, fruit trees, corn for silage or grain, alfalfa, small grains, hay, and pasture. In years when too little rain falls, crop growth can be increased through irrigation. A plowsole commonly develops if the soil is intensively row cropped, but this compacted layer can be broken up by deep plowing or subsoiling. (Capability unit I–1; woodland suitability group 2; urban group 1)

Copake loam, 3 to 8 percent slopes (CwB).—This gently undulating or gently sloping soil can be kept from eroding by using simple practices that control runoff. Use and suitability of this soil are much the same as those of Copake loam, 0 to 3 percent slopes. Many kinds of crops are suitable, including vegetables, sweet corn, fruit trees, corn for silage or grain, alfalfa, small grains, hay and pasture. Irrigation is desirable in dry years. If a plowsole develops in areas intensively farmed, it can be broken up by deep plowing or subsoiling. (Capability unit IIe–1; woodland suitability group 2; urban group 1)

Copake loam, 8 to 15 percent slopes (CwC).—This sloping or rolling soil is suited to about the same crops as other Copake soils, but it is more susceptible to erosion and needs to be managed more carefully. Some of the acreage is forested, and some is used for cultivated crops, hay, and pasture. Management is needed that controls soil losses, supplies organic matter, maintains good tilth and fertility, and conserves moisture. (Capability unit IIIe–1; woodland suitability group 2; urban group 2)

Deerfield Series

Soils of the Deerfield series are coarse textured and moderately well drained. These soils developed in sediments that were derived from granite, gneiss, schist, and quartzite. They occupy terraces, where the water table may rise to within 15 to 20 inches of the surface in wet periods.

A typical profile in a forested area has a surface layer of very dark gray loamy fine sand that is about 1 inch thick and is underlain by an old plow layer of very dark grayish-brown loamy fine sand about 6 inches thick. The subsoil is yellowish-brown and light olive-brown loamy fine sand and fine sand. It is distinctly mottled with dark brown, strong brown, and dark yellowish brown in the lower part. The sandy substratum is olive or light olive brown in color and contains distinct mottles of dark yellowish brown, dark brown, and light olive gray.

The Deerfield soils have moderately rapid or rapid permeability. They cover only a small acreage in the county and are not important to farming.

Typical profile of Deerfield loamy fine sand, 0 to 3 percent slopes, in a wooded area 1 mile north of Canaan Center on West Main Street, town of North Canaan:

O1 and O2—1½ inches to 0, fresh litter and some decomposed materials from a young stand of mixed hardwoods and white pine.

A1—0 to 1 inch, very dark gray (10YR 3/1) loamy fine sand, very weak, medium to fine, granular structure; very friable; many fine roots; very strongly acid; clear, wavy boundary.

Ap—1 inch to 7 inches, very dark grayish-brown (10YR 3/2) loamy fine sand; very weak, medium, granular structure; very friable; strongly acid; clear, smooth boundary.

B21—7 to 15 inches, yellowish-brown (10YR 5/6) loamy fine sand; very dark grayish-brown (10YR 3/2) worm casts; structureless (massive); very friable; strongly acid; clear, smooth boundary.

B22—15 to 22 inches, yellowish-brown (10YR 5/4) to brown (10YR 5/3) fine sand; common, medium, distinct mottles of dark brown (7.5YR 4/4) and strong brown (7.5YR 5/6), and a few mottles of light olive brown (2.5Y 5/4); structureless (single grain); very friable to loose; few fine roots; strongly acid; gradual, wavy boundary.

B23—22 to 28 inches, light olive-brown (2.5Y 5/4) fine sand; common, medium, distinct mottles of dark brown (7.5Y 4/4) and dark yellowish brown (10YR 4/4); loose; medium acid; gradual, wavy boundary.

C1—28 to 42 inches, olive (5Y 5/3) fine sand; common to few, medium, distinct mottles of dark yellowish brown (10YR 4/4) and light olive gray (5Y 6/2); lenses of loamy fine sand; structureless (single grain); loose; medium acid; gradual, wavy boundary.

C2—42 to 48 inches, light olive-brown (2.5Y 5/4) fine sand; common, medium, distinct mottles of dark brown 7.5YR 4/4) and light olive gray (5Y 6/2); structureless (single grain); loose; slightly acid.

Texture of the subsoil normally is loamy fine sand or loamy sand in the upper part but grades to medium and fine sand in the lower part. In most places the profile is free or nearly free of gravel. Below a depth of about 2 feet, however, lenses of gravel occur in places.

The Ap horizon is very dark grayish brown (10YR 3/2) or dark brown (10YR 3/3). The color of the B horizon fades with depth. The upper part of the B horizon has a hue of 7.5YR to 10YR, a value of 4 to 5, and chroma of 3 to 6. The lower part of the B horizon ranges from 10YR through 2.5Y in hue, but its value and chroma are the same as those of the upper B horizon. The C horizon generally has a hue of 2.5Y or 5Y.

The Deerfield soils are near the excessively drained Windsor and Hinckley soils. Soils of the Deerfield, Belgrade, and Sudbury series are all moderately well drained, but the Deerfield soils are coarse textured, the Belgrade soils are medium textured, and the Sudbury soils are underlain by coarse sand and gravel at a depth of about 2 feet.

Deerfield loamy fine sand, 0 to 3 percent slopes (DeA).—This soil is rapidly permeable but has a water table within 18 to 20 inches of the surface in wet periods. The soil is easily worked and responds to good management. In spring, however, it dries out less rapidly than the Windsor soils.

Supplying adequate lime and fertilizer is the main concern in the management of this soil. Pasture, hay, and silage corn can be grown, and cleared areas are used chiefly for these crops, though some areas are idle. (Capability unit IIs–1; woodland suitability group 6; urban group 8)

Dover Series

In the Dover series are friable, well-drained, nearly level to strongly sloping soils that developed in glacial till of Late Wisconsin age. The till consisted mainly of crystalline limestone but included variable amounts of schist, dolomitic limestone, and quartzite. Fragments of leached limestone are common in the profile. These soils occur chiefly in the limestone valley in the northwestern part of the county, but they also occupy scattered areas in the valley of the Housatonic River, as far south as New Milford. Permeability is moderately rapid or rapid.

A typical profile in a cultivated field has a surface layer of very friable, dark-brown fine sandy loam about 8 inches thick. The subsoil is brown, dark-brown, and dark yellowish-brown fine sandy loam that extends to a depth of about 30 inches. It is underlain by a sandy loam substratum that contains many fragments of decomposed and partly decomposed limestone. The profile is calcareous at a depth of 24 to 30 inches.

Typical profile of Dover fine sandy loam, 3 to 8 percent slopes, in an idle area covered with brush, 0.3 mile south of the intersection of Farnham Road and Falls Village Mountain Road in the town of Salisbury:

Ap—0 to 8 inches, dark-brown (10YR 3/3) fine sandy loam; weak, medium to fine, granular structure; very friable; numerous fine roots; coarse fragments about 5 percent; slightly acid; clear, smooth boundary.

B21—8 to 17 inches, brown (7.5YR 4/4) fine sandy loam; very weak, medium, subangular blocky structure; very friable; some fine roots; coarse fragments about 5 percent; neutral; gradual, wavy boundary.

B22—17 to 26 inches, dark-brown (7.5YR 4/4) to brown (7.5YR 5/4) fine sandy loam; yellowish-brown limestone ghosts; very weak, medium, subangular blocky structure; friable; a few fine roots; coarse fragments about 10 percent; neutral; gradual, wavy boundary.

B3—26 to 30 inches, dark yellowish-brown (10YR 4/4) fine sandy loam; numerous decomposed and partly decomposed limestone fragments, pale brown (10YR 6/3) and light yellowish brown (10YR 6/4) in color; very weak, medium, granular structure; no roots observed; coarse fragments about 15 percent; neutral; gradual, wavy boundary.

C—30 to 42 inches, grayish-brown (2.5Y 5/2) and some light olive-brown (2.5Y 5/4) sandy loam; pockets of decomposed and partly decomposed, pale-brown (10YR 6/3) limestone fragments; structureless (massive); coarse fragments 15 to 20 percent; calcareous. Coarse fragments consist largely of limestone but include some schist.

The texture of the B horizon generally is fine sandy loam but is loam in some places and, in the lower part of that horizon, may grade to sandy loam. The content of coarse fragments ranges from 5 to 15 percent in the solum, though generally it is more than 15 percent in the C horizon. Texture of the C horizon normally is fine sandy loam or sandy loam, and this horizon contains a variable amount of leached and disintegrated limestone fragments and, in places, lenses of loamy sand. The thickness of the solum averages between 26 and 30 inches but ranges from 20 to 30 inches. The depth to carbonates is 24 to 40 inches.

The Ap, or A1, horizon has a hue of 10YR or 7.5YR, a value of 3, and a chroma of 2 to 3. In the B horizon the hue is centered on 7.5YR but ranges from 5YR to 10YR; the value is 4 to 5, and the chroma is 4 to 8. The C horizon has a hue of 2.5Y, value of 5 to 6, and chroma of 2 to 4.

The Dover soils generally occupy lower positions in the limestone valley than the well-drained, medium-textured Stockbridge soils. In places they are near the Groton and Copake soils of the terraces. Dover soils also occur in the same areas as the moderately well drained Amenia soils, the poorly drained Kendaia soils, and the very poorly drained Lyons soils.

Dover fine sandy loam, 0 to 3 percent slopes (DoA).—This inextensive soil is very friable and has moderate available moisture capacity. It dries out fairly well in spring and after heavy rain. Runoff is slow. Erosion is only a slight hazard.

Some of the acreage is forested, and some is used for silage corn, hay, and pasture in support of dairying. The soil is suited to cultivated crops grown in the county, and it can be farmed intensively under good management. It is well suited to silage corn, sweet corn, small grains, orchard trees, and grasses and legumes. Alfalfa grows well alone or in mixture with grass. (Capability unit I–1; woodland suitability group 2; urban group 3)

Dover fine sandy loam, 3 to 8 percent slopes (DoB).—This soil has the profile described as typical for the series. Small scattered areas that were included in mapping are moderately eroded.

This soil is suited to crops commonly grown in the county. It is used mainly for silage corn, hay, and pasture in support of dairying. In fields where clean-tilled crops are grown, simple practices are needed to reduce runoff and control erosion, for unprotected areas are subject to washing. During long periods of dry weather, crops are damaged from lack of sufficient moisture sooner on this soil than on the Stockbridge and Paxton soils. (Capability unit IIe–1; woodland suitability group 2; urban group 3)

Dover fine sandy loam, 8 to 15 percent slopes (DoC).—Much of this soil is in cutover forest, but some areas have been cleared and are used mainly for hay and pasture or are idle. In fields that are clean cultivated, intensive practices are needed for controlling erosion and conserving moisture. Also needed is management that preserves or restores good tilth. Included in areas mapped as this soil are some moderately eroded areas. (Capability unit IIIe–1; woodland suitability group 2; urban group 4)

Dover fine sandy loam, 15 to 25 percent slopes (DoD).—This soil occupies small areas scattered throughout the limestone valley. It has rapid runoff and, if left unprotected, is highly erodible. Included in mapping are small areas of eroded soils.

Most of the acreage of this soil is used for hay, pasture, or woodland. Some areas are idle. Because slopes are strong and erosion is such a hazard, cultivated crops are not suited to this soil unless they are grown in a long rotation and are supported by intensive practices that control runoff. Hay and pasture are better suited crops. (Capability unit IVe–1; woodland suitability group 3; urban group 7)

Dover stony fine sandy loam, 3 to 8 percent slopes (DvB).—Except for its stony surface layer, this soil has a profile that is similar to the one described as typical for the series. Included in mapping are a few small areas having slopes of 0 to 3 percent.

Much of this soil is in cutover forest. Cleared areas are used mainly for pasture, but some are used for hay and some are idle. Stoniness limits the use of modern farm machinery on this soil. The soil is well suited to trees and pasture but also can be used for hay, orchards, and some kinds of small grain. (Capability unit IVes–1; woodland suitability group 2; urban group 3)

Dover stony fine sandy loam, 8 to 15 percent slopes (DvC).—This soil has a stony surface layer, but otherwise its profile is similar to the one described as typical for the series. Areas mapped as this soil include small scattered areas where slopes are 15 to 25 percent.

Woodland and pasture are good uses for this soil. Hay crops, orchards, and some kinds of small grain also can be grown. Stoniness limits the use of modern farm machinery, and much of the acreage is in cutover forest. Erosion is a severe hazard in unprotected areas. (Capability unit IVes–1; woodland suitability group 2; urban group 4)

Eel Series

The Eel series consists of moderately well drained, friable soils that developed in material recently deposited on flood plains. The deposits were derived from limestone, schist, and other rocks. These soils are common in the valley of the Housatonic River, and they occupy a small acreage along other rivers, including the Still River in New Milford and the Blackberry River in North Canaan. The soils are subject to occasional flooding. Their permeability is moderate.

A typical profile in a cultivated area has a surface layer of very dark grayish-brown silt loam about 8 inches thick. Underlying this layer is dark grayish-brown or grayish-brown silt loam that is mottled below a depth of 18 inches. The soil is slightly acid or neutral.

Typical profile of Eel silt loam in a cultivated field north of the intersection of Johnson Road and Route 126, town of Canaan:

Ap—0 to 8 inches, very dark grayish-brown (10YR 3/2) silt loam; weak, coarse, granular structure; friable; few fine roots; slightly acid; clear, smooth boundary.

C1—8 to 18 inches, dark grayish-brown (10YR 4/2) silt loam; structureless (massive), breaking into irregular clods; friable to very friable; few fine roots; neutral; gradual, wavy boundary.

C2—18 to 28 inches, grayish-brown (2.5Y 5/2) silt loam; common, medium, distinct mottles of dark yellowish brown (10YR 4/4) and brown (7.5YR 4/4), and faint mottles of gray (5Y 5/1); structureless (massive), but crushes to irregular clods; friable; few fine roots; neutral; gradual, wavy boundary.

C3—28 to 34 inches, grayish-brown (2.5Y 5/2) silt loam; few, medium, distinct mottles of dark yellowish brown (10YR 4/4); structureless (massive), but crushes to irregular clods; friable; few fine roots; neutral; abrupt, smooth boundary.

IIC4—34 to 40 inches, black (10YR 2/1) muck; medium acid; clear boundary.

IIIC5g—40 to 50 inches, dark-gray (5Y 4/1) silt loam; structureless (massive); decomposed and partly decomposed roots; neutral.

Silt loam is the dominant texture to a depth of 34 to 40 inches, but very fine sand and loamy very fine sand occur in the C horizon in places. Below a depth of 34 to 40 inches, the texture is variable. Although the typical profile shows a C4 horizon of black muck, buried horizons of peat or muck are not common in the Eel soils.

The A horizon generally has a hue of 10YR, a value of 2 to 4, and a chroma of 1 to 2. In the C horizon the hue ranges from 10YR to 5Y, the value is 3 to 5, and the chroma is near 2. Mottles generally occur at a depth of 14 to 20 inches. The profile ranges from medium acid to neutral.

The Eel soils are in the same drainage sequence as the well-drained Genesee soils, the poorly drained Limerick soils, and the very poorly drained Saco soils. Eel soils are finer textured and less acid than the Podunk soils.

Eel silt loam (0 to 3 percent slopes) (Ee).—This soil is subject to flooding but seldom during the growing season. The soil is free of surface stones and is easy to work, but it dries out slowly in spring. The available moisture capacity is high. Included in areas mapped as this soil are small areas outside the limestone valley that are strongly acid. Also included are small areas in which coarse-textured materials occur at a depth of 24 to 30 inches.

Most of the acreage has been cleared and is used for hay, pasture, and silage corn (fig. 7). The soil is well suited to legumes and grasses for hay or pasture but is poorly suited to alfalfa, though alfalfa can be seeded in a mixture that includes other legumes. The soil also is well suited to millet, sudangrass, and corn grown for silage. (Capability unit IIw-5; woodland suitability group 1; urban group 13)

Figure 7.—**Corn has been planted in this field of Eel silt loam along the Hollenbeck River.**

Enfield Series

The Enfield series is made up of nearly level to sloping, well-drained soils that developed in a thin mantle of silt underlain, at a depth of about 24 inches, by stratified sand and gravel. The underlying coarse material was derived from many kinds of acid rocks. These soils occur in the valleys of the Housatonic and Blackberry Rivers, and they also occupy scattered areas in other parts of the county. Their permeability is moderate in the surface layer and subsoil but is very rapid in the substratum.

A typical profile in a cultivated field has a dark-brown silt loam surface layer 8 inches thick. The upper part of the subsoil is yellowish-brown, very friable loam and very fine sandy loam, and the lower part is light olive-brown loamy very fine sand. At a depth of about 2 feet is the substratum consisting of sand and gravel derived from crystalline rocks.

Typical profile of Enfield silt loam, 3 to 8 percent slopes, in an abandoned field one-half mile west of Lanesville on U.S. Route 7 in the town of New Milford:

Ap—0 to 8 inches, dark-brown (10YR 3/3) silt loam; weak, medium, granular structure; very friable; numerous fine roots; strongly acid; clear, smooth boundary.

B21—8 to 16 inches, yellowish-brown (10YR 5/6) loam; structureless (massive) and crushes to irregular clods; very friable; few fine roots; strongly acid; clear, wavy boundary.

B22—16 to 22 inches, yellowish-brown (10YR 5/4) very fine sandy loam; structureless (massive) and crushes to irregular clods; very friable; few fine roots; strongly acid; clear, wavy boundary.

B23—22 to 24 inches, light olive-brown (2.5Y 5/4) loamy very fine sand; very friable; no roots observed; strongly acid; abrupt, wavy boundary.

IIC—24 to 42 inches, olive-brown (2.5Y 4/4) sand and gravel; loose; coarse fragments 50 to 60 percent; strongly acid. Gravel consists mostly of granite, gneiss, schist, and quartzite.

Texture in the solum generally ranges from silt loam to very fine sandy loam. The thickness of the solum ranges from 18 to 30 inches, and the range in depth to sand and gravel is the same. In areas where sand and gravel are nearer the surface than typical, the profile generally has a higher percentage of sand and gravel than in deeper areas.

The hue of the Ap horizon generally is 10YR, value is 3 to 4, and chroma is 2 to 3. The upper part of the B horizon has hues of 7.5YR and 10YR, value of 4 to 5, and chroma of 3 to 8. In the lower part of the B horizon the color is paler; generally, it is 10YR or 2.5Y in hue and 4 to 6 in value and chroma. Normally, the IIC horizon has a hue of 2.5Y.

The Enfield soils are in the same drainage sequence as the moderately well drained Tisbury soils. In addition, they occur near the Hartland and Merrimac soils. The sandy and gravelly substratum of the Enfield soils is missing in the Hartland soils, which developed in deep silt and very fine sand. Enfield soils are finer textured over sand and gravel than the Merrimac soils. In places the Enfield soils also are near the Hinckley soils, which consist of gravelly sandy loam and loamy sand that are shallow over gravel and sand.

Enfield silt loam, 0 to 3 percent slopes (EsA).—This soil is free of stones and easy to work, and it responds

well to good management. Areas mapped as this soil include small scattered areas in which the depth to sand and gravel is less than 18 inches.

Silage corn, small grains, potatoes, sweet corn, vegetable crops, alfalfa, hay, and pasture are well-suited crops. Most of the acreage has been cleared and is farmed or idle. Erosion is a slight hazard in places where the slope is gentle. (Capability unit I–1; woodland suitability group 2; urban group 1)

Enfield silt loam, 3 to 8 percent slopes (EsB).—This soil has the profile described as typical for the series. The soil has high available moisture capacity. It is very friable, free of stones, and easy to work. The response to good management is highly favorable. Included in mapping are a few small areas where the depth to sand and gravel is less than 18 inches.

This soil is well suited to silage corn, small grains, potatoes, sweet corn, vegetables, alfalfa, hay, and pasture. Most of the acreage has been cleared and is used for cultivated crops, hay, and pasture or is idle. However, because the soil is more sloping than Enfield silt loam, 0 to 3 percent slopes, it is more susceptible to erosion and needs more intensive practices for controlling runoff. (Capability unit IIe–1; woodland suitability group 2; urban group 1)

Enfield silt loam, 8 to 15 percent slopes (EsC).—Some of this inextensive soil is forested, and some has been cleared and is mainly in pasture and hay. A small acreage is used for silage corn, and small areas are idle.

This soil is suited to grasses, alfalfa, and other legumes for hay or pasture, and small grains. If the soil is intensively cultivated, management is needed that controls erosion, maintains fertility, and regularly supplies organic matter. (Capability unit IIIe–1; woodland suitability group 2; urban group 2)

Farmington Series

In the Farmington series are undulating to hilly, somewhat excessively drained or well-drained soils that are shallow to bedrock consisting of limestone or interbedded limestone and schist. These soils are in areas scattered throughout the western part of the county from North Canaan to New Milford in the limestone valley. Their permeability is moderate.

In a typical profile the surface layer is very friable, very dark grayish-brown silt loam about 8 inches thick. The subsoil is friable silt loam that is brown in the upper part and dark grayish brown in the lower part. Both of these layers are neutral in reaction. The depth to bedrock is about 18 inches.

Typical profile of Farmington very rocky silt loam, 3 to 15 percent slopes, in an unimproved pasture:

Ap—0 to 8 inches, very dark grayish-brown (10YR 3/2) silt loam; weak, coarse, granular structure; very friable; numerous fine roots; coarse fragments about 10 percent; neutral; clear, smooth boundary.

B21—8 to 16 inches, brown (10YR 4/3) silt loam; weak, medium, subangular blocky structure; friable; coarse fragments about 15 percent; neutral; gradual, wavy boundary.

B22—16 to 18 inches, dark grayish-brown (10YR 4/2) silt loam; weak, medium, subangular blocky structure; friable; coarse fragments about 15 percent; neutral.

IIR—18 inches +, siliceous limestone bedrock.

The texture of the A horizon is dominantly silt loam, and that of the B horizon is silt loam or loam. The content of coarse fragments in the solum ranges from 5 to 20 percent and, in some places, is highest in the lower part of the B horizon. In a few places the B22 horizon contains pebbles or channery fragments of limestone. Depth to hard bedrock ranges from 5 to 20 inches. The solum normally is slightly acid or neutral, but in places the A1, or Ap, horizon is strongly acid or medium acid.

The Ap horizon has a hue of 10YR, a value of 3 or 4, and a chroma of 2. In the B horizon the hue ranges from 7.5YR to 10YR, value is 4 or 5, and chroma is 2 to 4.

The Farmington soils commonly are near the Dover, Stockbridge, Amenia, and Kendaia soils. Farmington soils are finer textured and much less acid than the Hollis soils, which are shallow to acid crystalline rocks.

Farmington very rocky silt loam, 3 to 15 percent slopes (FaC).—The profile of this soil is the one described as typical for the series. Although the available moisture capacity is moderate above the bedrock, the soil is so shallow that it rapidly dries out early in summer. Loose stones are on the surface in some places. Included in areas mapped as this soil are scattered areas having a fine sandy loam surface layer.

Outcrops of rock and droughtiness limit the use of this soil for farm crops. A large part of the acreage is in cutover forest, but some areas have been cleared and are pastured or idle. The soil is suitable as woodland or for pasture or wildlife habitat. Pasture usually furnishes the best grazing before dry weather begins in summer. (Capability unit VIs–3; woodland suitability group 9; urban group 10)

Farmington very rocky silt loam, 15 to 35 percent slopes (FaE).—Because this soil is shallow to bedrock, it is droughty in summer and early in fall. Rock outcrops make up as much as 25 percent of the surface in some areas. In places the soil is covered with stones and boulders. Included in mapping are scattered areas where the surface layer is fine sandy loam.

Rockiness and steep slopes limit the use of this soil for farming. Most of the acreage is forested, but a few small areas have been cleared and are used for unimproved pasture or are idle. Woodland, wildlife habitat, and recreation are good uses for this soil. (Capability unit VIIs–3; woodland suitability group 10; urban group 10)

Farmington extremely rocky silt loam, 3 to 15 percent slopes (FmC).—In places as much as 50 percent of the area mapped as this soil is occupied by rock outcrops. The soil is largely in forest, but a small acreage has been cleared and is pastured or is idle. Forest, wildlife habitat, and unimproved pasture are suitable uses. (Capability unit VIIs–3; woodland suitability group 9; urban group 10)

Farmington extremely rocky silt loam, 15 to 35 percent slopes (FmE).—This soil is too steep, too rocky, and too droughty for most kinds of farming. The acreage is mainly in forest, a good use. Other suitable uses are wildlife habitat and recreation. (Capability unit VIIs–3; woodland suitability group 10; urban group 10)

Fredon Series

The Fredon series consists of nearly level, poorly drained soils that formed in fluvial sediments derived from crystalline limestone, Salisbury schist, dolomitic

limestone, and gneiss. These soils lie on terraces in the limestone valley. Their permeability is moderate in the surface layer and subsoil, and it is moderately rapid or rapid in the substratum.

In a typical profile the surface layer is very dark brown silt loam 8 inches thick. The subsoil, which extends to a depth of 26 inches, is olive-gray loamy very fine sand and fine sandy loam that are mottled with various shades of gray, brown, and olive. Both of these layers are friable and are slightly acid or neutral. The substratum is gravelly sandy loam.

Typical profile of Fredon silt loam in an area of brushy forest, 0.9 mile north of the intersection of Barnes Road and U.S. Route 7:

Ap—0 to 8 inches, very dark brown (10YR 2/2) silt loam; weak, medium, granular structure; friable; numerous fine and medium roots; coarse fragments less than 5 percent; slightly acid; clear, smooth boundary.

B21g—8 to 16 inches, olive-gray (5Y 5/2) loamy very fine sand; thin lenses of loamy fine sand; medium, distinct mottles of greenish gray (5GY 6/1) and yellowish brown (10YR 5/4); structureless (massive); friable; few fine roots; coarse fragments about 10 percent; slightly acid; gradual, wavy boundary.

B22g—16 to 26 inches, olive-gray (5Y 5/2–4/2) fine sandy loam; many, medium and fine, distinct mottles of olive (5Y 5/6), light olive brown (2.5Y 5/6), and yellowish brown (10YR 5/4); numerous fragments of leached, light-gray (2.5Y 7/2) limestone; weak subangular blocky structure; friable; few fine roots; very coarse fragments about 10 percent; neutral; gradual, wavy boundary.

C—26 to 42 inches, olive-gray (5Y 5/2), olive (5Y 5/6), and light olive-brown (2.5Y 5/6) sandy loam with numerous fragments of leached, grayish-brown (2.5Y 5/2) limestone; structureless (massive); friable; no roots observed; neutral.

Texture in the B horizon generally ranges from loam to sandy loam, but in places there are lenses of finer or coarser textured sediments. Below a depth of 30 to 36 inches, gravel and sand are common in some places. Generally, the clay content is less than 18 percent. The thickness of the solum ranges from 22 to 30 inches. The solum is medium acid to neutral, and the substratum is slightly acid to moderately alkaline.

The A1 horizon ranges from 4 to 6 inches in thickness. This horizon has a hue of 10YR, value of 2 to 3, and chroma of 1 to 2. In the B horizon the hue of the matrix ranges from 10YR to 5YR, value is 5 or 6, and chroma is 1 to 3. The B horizon is strongly mottled with shades of yellowish brown, strong brown, olive, and gray. Hue of the mottles is 7.5YR to 2.5Y.

The Fredon soils are near the excessively drained Groton soils, the well drained Copake soils, the moderately well drained Hero soils, and the very poorly drained Granby soils. Fredon soils are less acid than the Walpole soils.

Fredon silt loam (0 to 3 percent slopes) (Fr).—This soil is moderately permeable but has a high water table at or near the surface in winter and spring. The acreage is small and mostly in forest.

This soil is suited to pasture, hay, trees, and wildlife habitat. Unless drainage is improved, however, cultivated crops cannot be successfully grown. If the soil is drained, it can be used for silage corn and other crops. Improving drainage is not feasible in some areas, because outlets are lacking. (Capability unit IIIw-1; woodland suitability group 4; urban group 11)

Genesee Series

The Genesee series consists of well-drained soils that developed in sediments recently deposited along rivers and other streams. The sediments were derived from mixed materials, some of them calcareous. These soils are subject to seasonal flooding. They lie mainly along the Housatonic River, but some areas are along other rivers, including the Still River in New Milford and the Whiting and Blackberry Rivers in North Canaan. The Genesee soils are moderately permeable throughout.

A typical profile in a cultivated field has a surface layer of friable, very dark grayish-brown silt loam about 10 inches thick. This layer includes streaks or lenses of gray sand. It is underlain by a layer of dark-brown silt loam that is similar in many ways to the surface layer. Beginning at a depth of about 30 inches, the soil material is dark-brown to brown very fine sandy loam. The profile is neutral throughout.

Typical profile of Genesee silt loam in a cultivated field one-half mile east of the intersection of U.S. Route 7 and Lower Road, on the north side of Lower Road, in the town of North Canaan.

Ap—0 to 10 inches, very dark grayish-brown (10YR 3/2) silt loam; light brownish-gray (2.5Y 6/2) streaks of sand; weak, medium, subangular blocky structure (probably because of traffic compaction); friable; many fine roots; neutral; clear, smooth boundary.

C1—10 to 26 inches, dark-brown (10YR 3/3) silt loam; lenses of very dark gray (10YR 3/1) organic material; structureless (massive) and crushes to irregular clods; very friable; numerous fine roots; worm and root holes common; neutral; gradual, wavy boundary.

C2—26 to 30 inches, dark-brown (10YR 3/3) silt loam; structureless (massive) and crushes to irregular clods; friable; few fine roots; neutral; clear, wavy boundary.

C3—30 to 50 inches, dark-brown to brown (10YR 4/3–5/3) very fine sandy loam; structureless (massive); friable; few fine roots; neutral.

Silt loam is the dominant texture, and in areas along larger streams the profile is nearly uniform in texture to a depth of 30 to 40 inches. Along the smaller streams the C horizon is mainly silt loam or very fine sandy loam but includes lenses of coarser textured material. Lenses of gray sand may occur in the Ap horizon in fields that have been recently covered with fresh soil material and then cultivated. The A horizon ranges from strongly acid to slightly acid, and the C horizon from medium acid to mildly alkaline.

The A horizon is 10YR to 2.5Y in hue, 3 to 4 in value, and 2 to 3 in chroma. The C horizon generally has a hue of 10YR to 2.5Y, a value of 3 to 5, and a chroma of 2 to 4.

The Genesee soils occur closely with the moderately well drained Eel soils, the poorly drained Limerick soils, and the very poorly drained Saco soils. The Genesee soils are finer textured than the Ondawa soils, which developed in sediments having a texture of fine sandy loam or sandy loam.

Genesee silt loam (0 to 3 percent slopes) (Gf).—This soil lies near streams, where it is subject to flooding late in fall and early in spring (fig. 8). It is stone free and easily worked, but it dries out slowly in spring. The available moisture capacity is high. Surface runoff is slow. Included in areas mapped as this soil are small areas of a soil that is strongly acid and small areas in

Figure 8.—**Genesee silt loam and other soils on far side of stream. Along the stream is Riverwash, a miscellaneous land type.**

which underlying sand and gravel are at a depth of 24 to 36 inches.

Most of this soil has been cleared and is used in dairying, but some of the acreage is idle. Silage corn, hay, and pasture are the principal crops grown. The soil is suited to silage corn, millet, and grass-legume mixtures. (Capability unit IIw–4; woodland suitability group 2; urban group 13)

Gloucester Series

The Gloucester series consists of somewhat excessively drained soils that developed in very friable, coarse-textured glacial till. The till was derived mainly from coarse-textured granite but in places included some gneiss. Consequently, the soil material has a relatively high content of sand. These soils lie in small to fairly large areas that are scattered mainly in the eastern and southern parts of the county. Permeability is moderately rapid, and the available moisture capacity is low.

A typical profile in a cultivated area has a dark-brown sandy loam surface layer 8 inches thick. The subsoil is dark yellowish-brown sandy loam in the upper part and grades to yellowish-brown loamy sand in the lower part. These layers are all very friable. Below a depth of 24 inches, the soil is light olive-brown gravelly loamy sand and olive gravelly coarse sand. Stones, cobblestones, and pebbles are common on the surface and in the profile. These coarse fragments are granitic in origin.

Typical profile of Gloucester stony sandy loam, 3 to 8 percent slopes, in an idle area 1½ miles south of Milton on South Street in the town of Litchfield:

Ap—0 to 8 inches, dark-brown (10YR 3/3) sandy loam; weak, medium, granular structure; very friable; numerous fine roots; coarse fragments about 5 percent; very strongly acid; clear, smooth boundary.

B21—8 to 14 inches, dark yellowish-brown (10YR 4/4) sandy loam; structureless (massive), breaking into soft clods when disturbed; very friable; common fine and medium roots; coarse fragments about 15 percent; strongly acid; gradual, wavy boundary.

B22—14 to 24 inches, yellowish-brown (10YR 5/6) loamy sand; structureless (single grain); very friable; few fine roots; coarse fragments 15 to 20 percent; strongly acid; gradual, wavy boundary.

C1—24 to 28 inches, light olive-brown (2.5Y 5/4) gravelly loamy sand; structureless (single grain); very friable to loose; few fine roots; strongly acid; gradual, wavy boundary.

C2—28 to 48 inches, olive (5Y 5/3) gravelly coarse sand; structureless (single grain); loose cobblestones and stones numerous; few roots; strongly acid.

The upper part of the B horizon is sandy loam or loamy sand, and the lower part generally is loamy sand. The C horizon is gravelly loamy sand or sand. The proportion of coarse fragments in the solum normally ranges from 15 to 40 percent and in the C horizon it generally exceeds 30 percent. Depth of the solum is about 24 inches in most places, but it ranges from 20 to 30 inches. Stones and boulders are conspicuous throughout the profile.

The Ap horizon has a hue of 10YR, a chroma of 2 or 3, and a value of 3 or 4. In the B horizon the hue is 7.5YR or 10YR in the upper part and grades to 2.5Y in the lower part; value is 4 to 6, and chroma is 3 to 8. The C horizon commonly has a hue of 2.5Y or 5Y.

The Gloucester soils occur with the Shapleigh, Charlton, and Hollis soils. They are similar in texture to Shapleigh soils, but the Shapleigh are shallow over bedrock. Gloucester soils are coarser textured than the Charlton soils. The Gloucester and the Merrimac soils are somewhat similar in texture, but the Merrimac developed on stratified sand and gravel.

Gloucester sandy loam, 3 to 8 percent slopes (GaB).—This soil is droughty and generally holds too little moisture available for cultivated crops and other plants in summer. Small areas included in mapping are eroded, and small ones have slopes of 0 to 3 percent.

This soil is used mainly for hay and pasture. Some small fields are used for alfalfa, orchards, and silage corn, and some areas are idle. If the soil is properly limed and fertilized, it is well suited to alfalfa and early vegetable crops. Simple practices are adequate for controlling runoff. (Capability unit IIs–2; woodland suitability group 6; urban group 3)

Gloucester sandy loam, 8 to 15 percent slopes (GaC).—This sloping or rolling soil generally occupies small areas scattered in the southern and eastern parts of the county. Included in mapping are some eroded areas.

This soil is used mainly for hay and pasture or is idle. Small fields are cultivated. Alfalfa grows well if it is properly limed and fertilized, but shallow-rooted legumes and grasses lack sufficient moisture most of the year. The soil has more rapid runoff than Gloucester sandy loam, 3 to 8 percent slopes, and it needs to be managed more carefully. (Capability unit IIIe–3; woodland suitability group 6; urban group 4)

Gloucester sandy loam, 15 to 25 percent slopes (GaD).—This soil occupies only a small acreage, a large percentage of which is forested. Cleared areas are used mainly for hay and pasture or are idle. Surface runoff is rapid, and erosion is a severe hazard that limits use of the soil for cultivation unless the crop rotation is long and erosion control practices are intensive. The soil is suitable for hay, pasture, woodland, and wildlife habitat. Included in mapping are a few small areas that are eroded and have slopes of 25 to 35 percent. (Capability unit IVe–1; woodland suitability group 3; urban group 7)

Gloucester stony sandy loam, 3 to 8 percent slopes (GbB).—This soil has the profile described as typical for the series. The soil is in small areas that are scattered mainly in the southern and eastern parts of the county. It is inextensive, and most of it is forested. Cleared areas are chiefly in hay and pasture or are idle. Because the soil is stony, it is not suitable for row cropping, but in most places it can be worked for improved pasture, hay, tree fruits, and small grains. The soil is somewhat droughty and supplies insufficient moisture for crops in dry periods. Included in mapping are small areas of stony soils having slopes of 0 to 3 percent. (Capability unit IVes–1; woodland suitability group 6; urban group 3)

Gloucester stony sandy loam, 8 to 15 percent slopes (GbC).—This soil occupies only a small acreage and is mainly in forest. It is too stony for row crops but generally can be worked for improved pasture, hay, tree fruits, and small grains. The soil is somewhat droughty and holds too little moisture available for plants in dry periods. Medium runoff causes a moderate hazard of erosion in unprotected areas. (Capability unit IVes–1; woodland suitability group 6; urban group 4)

Gloucester stony sandy loam, 15 to 25 percent slopes (GbD).—This inextensive soil is mostly forested. In some areas it has been cleared and is pastured or idle. Because of stones and steep slopes, use is limited mainly to woodland, pasture, and wildlife habitat. (Capability unit VIes–1; woodland suitability group 3; urban group 7)

Gloucester very stony sandy loam, 3 to 15 percent slopes (GeC).—This soil is chiefly in forest. Open areas are used mainly for unimproved pasture or are idle, but a few of them are in hay or improved pasture. The soil is too stony for most kinds of farming but can be used for woodland or pasture. It is not suited to cultivated crops. Growth of forage plants in unimproved pasture can be increased by fertilizing and controlling brush. Included in areas mapped as this soil are scattered areas of Charlton and of Shapleigh soils. (Capability unit VIs–1; woodland suitability group 7; urban group 4)

Gloucester very stony sandy loam, 15 to 35 percent slopes (GeE).—A large part of this soil is wooded. Small open areas are used for unimproved pasture or are idle. The soil is so stony and so steep that its use should be limited mainly to woodland and wildlife habitat. Included in mapping are small areas of Shapleigh soils. (Capability unit VIIs–1; woodland suitability group 8; urban group 7)

Granby Series

The Granby series consists of nearly level, very poorly drained, sandy soils that developed in fluvial sediments derived from limestone, quartzite, schist, and other rocks. These soils occur near Robbins Swamp in the town of Canaan. Their permeability is moderately rapid, but drainage is restricted by a seasonal high water table.

A typical profile in a forested area has a surface layer of black loamy fine sand 10 inches thick. This is under-

lain by a subsoil of friable, dark grayish-brown and grayish-brown loamy fine sand. Beginning at a depth of 14 inches and extending to a depth of 42 inches, there is a layer of faintly mottled gray sand that is loose and is neutral in reaction. The underlying material, to a depth of 60 inches, is calcareous, gray fine sand and lenses of very fine sand.

Typical profile of Granby loamy fine sand in a wooded area 3,000 feet east of the intersection of Sand Road and Page Road, Falls Village, in the town of Canaan:

A1—0 to 10 inches, black (10YR 2/1) loamy fine sand; weak, coarse, granular structure; very friable; numerous medium and fine roots; slightly acid; gradual, wavy boundary.

B—10 to 14 inches, dark grayish-brown and grayish-brown (2.5Y 4/2–5/2) loamy fine sand; structureless (massive); very friable; few fine roots; neutral; clear, wavy boundary.

C1—14 to 20 inches, gray (5Y 5/1) sand and bands of fine sand; few, fine, faint mottles of light olive brown (2.5Y 5/4) and dark yellowish brown (10YR 4/4); structureless (single grain); loose; neutral; clear, wavy boundary.

C2—20 to 42 inches, gray (5Y 5/1) coarse sand; few, fine, faint mottles of light olive brown (2.5Y 5/4); structureless (single grain); loose; neutral; clear, wavy boundary.

C3—42 to 60 inches, gray (5Y 5/1) fine sand; few fine lenses of gray (N 5/0) very fine sand; structureless (single grain); loose; calcareous.

The A1, or Ap, horizon commonly is loamy fine sand that has a high organic-matter content. The loamy fine sand of the B horizon grades to loamy sand or sand in the C horizon. The content of gravel ranges from 0 to 10 percent. Hues in the C horizon are 2.5Y and 5Y; value in this horizon is 5 or 6, and chroma is 1 or 2.

The Granby soils most commonly occur with the well drained Copake soils, the moderately well drained Hero soils, and the poorly drained Fredon soils, all of which developed in fluvial sediments containing limestone. The Granby soils are similar to the Scarboro soils in texture, but they are not acid throughout like those soils.

Granby loamy fine sand (0 to 3 percent slopes) (Gn).—In this soil internal drainage is restricted by a water table that rises to the surface in winter and spring. Improving drainage is impractical in some places, because adequate outlets are lacking.

Although this soil is used for seasonal pasture in cleared areas, most of the acreage is forested. If the soil is partly drained, it is suited to moisture-tolerant grasses and legumes for hay or improved pasture. It also can be used as habitat for wildlife. (Capability unit Vw–1; woodland suitability group 5; urban group 12)

Groton Series

In the Groton series are excessively drained, nearly level to undulating and rolling soils that developed in stratified sandy and gravelly drift consisting of limestone, as well as schist and other rocks. These soils occur mainly in the valley of the Housatonic River in the northwestern part of the county. Their permeability is moderately rapid in the surface layer and subsoil and is very rapid in the substratum.

A typical profile in a cultivated field has a surface layer of dark-brown gravelly sandy loam 6 inches thick. The subsoil is dark yellowish-brown gravelly sandy loam. This layer extends to a depth of 12 inches. The substratum is calcareous, dark grayish-brown and olive-gray gravel and sand.

Typical profile of Groton gravelly sandy loam, 3 to 15 percent slopes, in a pasture 800 feet west of the northern tip of Mudge Pond in the town of Sharon:

Ap—0 to 6 inches, dark-brown (10YR 3/3) gravelly sandy loam; weak, fine, granular structure; very friable; numerous fine roots; coarse fragments 20 to 25 percent; slightly acid; clear, smooth boundary.

B2—6 to 12 inches, dark yellowish-brown (10YR 4/4) gravelly sandy loam; weak, medium, granular structure; very friable; common fine roots; coarse fragments about 25 percent; slightly acid; clear, wavy boundary.

IIC—12 to 44 inches, dark grayish-brown (2.5Y 4/2) and olive-gray (5Y 5/2) gravel and sand, with lenses of coarse sand; loose; few fine roots in upper half of the horizon; strong-brown (7.5YR 5/6–5/8) limestone ghosts; coarse fragments about 50 percent; calcareous.

Texture of the B horizon is gravelly sandy loam or gravelly loamy sand. The depth to sand and gravel ranges from 8 to 16 inches, and this is generally the same as the range in thickness of the solum. Normally, the solum is thinnest in areas on ridges and knobs, and it is thickest on lower side slopes and terraces. The gravel content, by volume, is 20 to 55 percent in the solum and is 50 to 65 percent in the substratum. Depth to carbonates is generally between 20 and 40 inches but in places is more than 40 inches. The solum ranges from medium acid to neutral.

The color of the Ap horizon ranges from very dark grayish brown (10YR 3/2) to brown (10YR 4/3). The B horizon has a hue of 10YR or 2.5Y, value of 4 to 5, and chroma of 2 to 6. Limestone ghosts in the IIC horizon are strong brown (7.5YR 5/6–5/8) to yellowish brown (10YR 5/6–5/8).

The Groton soils are near the well drained Copake soils, the moderately well drained Hero soils, and the poorly drained Fredon soils. Groton soils are similar to the Hinckley soils in texture but are less acid. The Groton soils also occur near soils of the Stockbridge and Dover series, but those soils developed in glacial till containing limestone.

Groton gravelly sandy loam, 0 to 3 percent slopes (GrA).—This soil is inextensive in Litchfield County. Its available moisture capacity is low. Included in mapping are small areas where the surface layer is loam or loamy sand.

Most of this soil has been cleared and is used mainly for pasture and hay or is idle. The soil is fairly well suited to alfalfa but, unless it is irrigated in summer, is not so well suited to general farm crops. (Capability unit IIIs–2; woodland suitability group 6; urban group 1)

Groton gravelly sandy loam, 3 to 15 percent slopes (GrC).—This soil has the profile described as typical for the series. Included in mapping, at the base of Riga Mountain, are small areas of a soil that is more acid than normal Groton soils. Also included are small areas in which the surface layer is gravelly loamy sand.

Some areas of this soil are in cutover forest, and some have been cleared and are used mainly for hay and pasture or are idle. The soil is poorly suited to general crops because it is droughty, susceptible to erosion, and irregularly sloping. It is fairly well suited to alfalfa, however. Irrigation water is needed in summer to keep hayfields and pastures from drying out. Applications of fertilizer should be heavy and frequent. (Capability unit IIIse–1; woodland suitability group 6; urban group 1)

Hartland Series

The Hartland series consists of deep, well-drained, friable soils that developed in silt and very fine sand deposited on terraces in valleys. These deposits were derived mainly from granite, gneiss, and schist but also from other rocks. Hartland soils are common in the valley of the Houstaonic River and along the Still River in New Milford. In addition, they occur in areas scattered in other parts of the county. These soils have moderate permeability.

A typical profile in a cultivated area has a surface layer of dark-brown silt loam about 8 inches thick. The upper part of the subsoil is yellowish-brown and light olive-brown silt loam, and the lower part is light olive-brown very fine sandy loam in which there are thin lenses of silt loam. This layer extends to a depth of about 30 inches. The substratum is olive-colored very fine sandy loam or silt loam.

Typical profile of Hartland silt loam, 3 to 8 percent slopes, in a cultivated area east of the intersection of Route 25 and Stedman Road, Nepaug, town of New Hartford:

Ap—0 to 8 inches, dark-brown (10YR 4/3) silt loam; weak, medium, granular structure; very friable; numerous fine roots; strongly acid; clear, smooth boundary.

B21—8 to 18 inches, yellowish-brown (10YR 5/6) silt loam; structureless (massive), breaking into soft clods when disturbed; friable; many fine roots; strongly acid; gradual, wavy boundary.

B22—18 to 26 inches, light olive-brown (2.5Y 5/6) silt loam; structureless (massive), breaking into soft clods when disturbed; friable; few medium and fine roots; strongly acid; gradual, wavy boundary.

B23—26 to 30 inches, light olive-brown (2.5Y 5/4) very fine sandy loam and thin lenses of olive-brown (2.5Y 4/4) silt loam; structureless (massive), breaking into soft clods when disturbed; very friable; few fine roots; very strongly acid; gradual, wavy boundary.

C—30 to 44 inches, olive (5Y 5/3) very fine sandy loam to silt loam; structureless (massive); very friable; no roots observed; very strongly acid.

The upper part of the B horizon is silt loam or very fine sandy loam. The lower part of this horizon commonly is very fine sandy loam that, in some places, grades to loamy very fine sand or loamy fine sand in the C horizon. Thickness of the solum ranges from 24 to 36 inches.

The Ap horizon has a hue of 10YR, a value of 3 to 4, and a chroma of 2 to 3. The upper part of the B horizon is 10YR or 7.5YR in hue, 4 to 6 in value, and 3 to 8 in chroma. In the lower part of the B horizon, hue ranges from 10YR to 2.5Y; value and chroma are about the same as those in the upper part. The C horizon has a hue of 10YR to 5Y, value of 5 to 7, and chroma of 2 to 3.

The Hartland soils are in the same drainage sequence as the moderately well drained Belgrade soils, the poorly drained Raynham soils, and the very poorly drained Birdsall soils. Hartland soils are near the Enfield, Merrimac, and Windsor soils. The solum of the Hartland soils is similar in texture to that of the Enfield soils, which are underlain by sand and gravel at a depth of about 2 feet.

Hartland silt loam, 0 to 3 percent slopes (HbA).—This soil is friable and easy to work. Its available moisture capacity is high, and its response to good management is favorable. In the northwestern part of the county, areas mapped as this soil include small areas in which the underlying material has been influenced by limestone and the soil is less acid than normal Hartland soils.

Most of this soil has been cleared, and the rest is in cutover forest. Some cleared areas are idle, and others are used for crops and pasture in support of dairying. The soil is well suited to cultivated crops grown in the county, including silage corn, vegetable crops, small grains, alfalfa, hay, and pasture. Unprotected areas are subject to some erosion in winter and early in spring. (Capability unit I–1; woodland suitability group 2; urban group 1)

Hartland silt loam, 3 to 8 percent slopes (HbB).—The profile of this soil is the one described as typical for the Hartland series. The soil is friable, has high available moisture capacity, is easily worked, and responds to good management. Small inclusions mapped in the northwestern part of the county have underlying material that has been influenced by limestone.

This soil has been cleared in most places, but part of the acreage is in cutover forest. Some cleared areas are used for crops and pasture in support of dairying, and the rest are idle. The soil is well suited to cultivated crops grown in the county, including silage corn, vegetable crops, small grains, alfalfa, hay, and pasture. Farming can be intensive if fertility and good tilth are maintained and if regular additions of organic matter are provided. Surface runoff is greater on this soil than on Hartland silt loam, 0 to 3 percent slopes, and more intensive practices are needed for controlling erosion. (Capability unit IIe–1; woodland suitability group 2; urban group 1)

Hartland silt loam, 8 to 15 percent slopes (HbC).—This inextensive soil is used mainly for hay and pasture, but small areas are used for silage corn. The soil is suited to alfalfa and other close-growing crops. Erosion can be a severe hazard, and if cultivated crops are grown, they should be part of a long rotation supported by other intensive practices for controlling runoff. (Capability unit IIIe–1; woodland suitability group 2; urban group 2)

Hero Series

In the Hero series are nearly level and gently sloping, moderately well drained soils that developed in fluvial materials containing limestone. These soils occur in the limestone valley in the northwestern part of the county. They are medium acid to mildly alkaline in the surface layer and subsoil and generally are neutral to calcareous in the underlying gravelly material. Their permeability is moderate.

A typical profile has a very dark grayish-brown loam surface layer about 9 inches thick. This is underlain by an olive-brown and dark grayish-brown silt loam subsoil that grades to gravelly sandy loam in the lower part. The subsoil is neutral or mildly alkaline and extends to a depth of 27 inches. Just below it is a gravel and sand substratum that contains many limestone fragments and is calcareous. Mottles occur in the lower subsoil and substratum.

Typical profile of Hero loam, 0 to 3 percent slopes, in a pasture 200 feet southwest of the intersection of Route 4 and Silver Lake Road, town of Sharon:

Ap—0 to 9 inches, very dark grayish-brown (10YR 3/2) loam; weak, medium, granular structure; very friable; numerous fine grass roots; coarse fragments about 15 percent; slightly acid; clear, smooth boundary.

B21—9 to 18 inches, olive-brown (2.5Y 4/4) gravelly silt loam; very weak, medium, subangular blocky structure; few fine roots; coarse fragments 20 to 25 percent; neutral; gradual, wavy boundary.

B22—18 to 24 inches, dark grayish-brown (2.5Y 4/3) gravelly silt loam; few, medium and fine mottles of dark brown (7.5YR 4/4) and grayish brown (2.5Y 5/2); very weak, subangular blocky structure; friable; no roots observed; coarse fragments about 25 percent; neutral; clear, wavy boundary.

B23—24 to 27 inches, dark grayish-brown (2.5Y 4/2) gravelly sandy loam; faint mottles of dark yellowish brown (10YR 4/4) and grayish brown (2.5Y 5/2); structureless (massive); coarse fragments 30 to 35 percent; mildly alkaline; clear, wavy boundary.

IIC—27 to 42 inches, grayish-brown (2.5Y 5/2) and dark grayish-brown (2.5Y 4/2) gravel and sand; thin lenses of gravelly sandy loam; few, faint mottles of light olive brown (2.5Y 5/6); strong-brown (7.5YR 5/6) and gray (2.5Y 6/0) limestone ghosts; coarse fragments about 60 percent; calcareous. Coarse fragments in the profile are mainly Salisbury schist but include some Stockbridge limestone and quartzite.

The A horizon and upper part of the B horizon are loam or silt loam. The B horizon is coarser textured with increasing depth and grades to fine sandy loam or sandy loam in the lower part. The content of coarse fragments in the solum ranges from 10 to 35 percent. Thickness of the solum ranges from 20 to 30 inches. Depth to mottles having a chroma of 2 is 12 to 20 inches. The solum is medium acid to mildly alkaline; the pH generally increases with depth. Generally, the depth to carbonates is 24 to 40 inches but may be more. In places there are limestone ghosts in the lower part of the B horizon.

The Ap horizon has a hue of 10YR, a value of 3, and a chroma of 1 to 3. In the upper part of the B horizon, hue is 10YR or 2.5Y, value is 4 to 5, and chroma is 4 to 6. Limestone ghosts are yellowish brown (10YR 5/6) or strong brown (7.5YR 5/6).

The Hero soils are in the same drainage sequence as the excessively drained Groton soils, the well-drained Copake soils, and the poorly drained Fredon soils, and they also occur near the very poorly drained Granby soils. The Hero soils are moderately well drained like the Sudbury soils, but they are finer textured than those soils and are not acid throughout the profile. In contrast to the Hero soils, the acid Tisbury soils developed in silt and very fine sand over sand and gravel.

Hero loam, 0 to 3 percent slopes (HeA).—This soil has the profile described as typical for the series. The soil is friable, free of surface stones, and easily worked, and it has high available moisture capacity. A seasonal high water table restricts drainage at times when it rises to within 15 to 20 inches of the surface. Included with this soil in mapping are areas where the surface layer is silt loam. Also included are small scattered areas in which this layer is fine sandy loam or sandy loam.

This soil is partly in forest, but some areas have been cleared. These areas are used chiefly for hay, pasture, and silage corn. Legumes and grasses grow well, though alfalfa is subject to frost heaving and should be seeded in a grass-legume mixture. A good growth of silage corn can be obtained in dry years. Some other kinds of cultivated crops are suitable if excess water is removed through drainage ditches or interception ditches. (Capability unit IIw–1; woodland suitability group 1; urban group 8)

Hero loam, 3 to 8 percent slopes (HeB).—This soil has medium to rapid surface runoff and, if used for clean-tilled crops, is more likely to erode than Hero loam, 0 to 3 percent slopes. A large part of the acreage is in cutover forest. Cleared areas are in hay, pasture, or silage corn, or are idle. Legumes and grasses grow well, but alfalfa is subject to frost heaving and should be seeded in a mixture with grass. If excess water is removed, some kinds of cultivated crops are suitable. Some areas included in mapping have a surface layer of silt loam, and small ones have a surface layer of fine sandy loam or sandy loam. (Capability unit IIwe–1; woodland suitability group 1; urban group 8)

Hinckley Series

Soils of the Hinckley series are nearly level to undulating and rolling, excessively drained, and droughty. They developed in deep deposits of stratified sand and gravel that were derived mainly from granite, gneiss, and schist. Permeability is moderately rapid or rapid in the surface layer and is very rapid in the substratum.

A typical profile in a cultivated area has a plow layer of dark yellowish-brown gravelly sandy loam about 6 inches thick. The upper part of the subsoil is brown gravelly sandy loam, and the lower part is dark yellowish-brown gravelly loamy sand. The subsoil extends to a depth of 24 inches. It is underlain by a substratum of dark grayish-brown, stratified gravel and sand.

Typical profile of Hinckley gravelly sandy loam, 3 to 15 percent slopes, in an idle area directly west of the intersection of Washington Road and Sprain Brook Road in the town of Woodbury:

Ap—0 to 6 inches, dark yellowish-brown (10YR 3/4) gravelly sandy loam; weak, medium, granular structure; very friable; numerous fine roots; coarse fragments about 20 percent; very strongly acid; clear, smooth boundary.

B21—6 to 12 inches, brown (7.5YR 4/4) gravelly sandy loam; structureless (massive); very friable; numerous fine roots; coarse fragments 25 to 30 percent; very strongly acid; clear, wavy boundary.

B22—12 to 24 inches, dark yellowish-brown (10YR 4/4) gravelly loamy sand and lenses of coarse sand; structureless (single grain); loose; few fine roots; coarse fragments about 35 percent; strongly acid; clear, wavy boundary.

IIC—24 to 50 inches, dark grayish-brown (10YR 4/2) and brown (10YR 5/3) gravel and coarse sand; loose; no roots observed; coarse fragments about 50 to 60 percent; strongly acid.

The A horizon is gravelly sandy loam or gravelly loamy sand. Below a depth of 6 to 12 inches, the B horizon generally is gravelly loamy sand, gravelly coarse sand, or coarse sand. The materials underlying the B horizon are sand and water-rounded pebbles and cobblestones that are stratified below a depth of 24 to 48 inches. The thickness of the solum commonly is 16 to 24 inches but ranges from 10 to 24 inches. Gravel and cobblestones make up 20 to 50 percent of the solum, by volume, and in places as much as 75 to 80 percent of the C horizon.

The Ap horizon has a hue of 10YR; its value and chroma both are 2 to 4. The B horizon normally is 7.5YR or 10YR in hue, 3 to 5 in value, and 4 to 8 in chroma in the upper part. Hue in the C horizon generally is 10YR or 2.5Y, value is 4 to 8, and chroma is 2 to 4.

The Hinckley soils are in the same drainage sequence as the moderately well drained Sudbury soils, the poorly drained Walpole soils, and the very poorly drained Scarboro soils. They also occur near the Merrimac, Windsor, and Hartland soils. The Hinckley soils are not so deep to sand and gravel as the Merrimac soils, and they are more droughty. In contrast to the Hinckley soils, the Windsor soils developed in

deep loamy sand and sand, and the Hartland soils are medium textured. Hinckley soils are similar to the Groton soils in texture, but those soils formed on deposits of sand and gravel derived largely from schist and limestone.

Hinckley gravelly sandy loam, 0 to 3 percent slopes (HkA).—This inextensive soil is in areas that are small and scattered. Its available moisture capacity is low. In the town of Woodbury, areas mapped as this soil include small tracts where the profile is reddish brown because the soil material has been influenced by reddish-brown Triassic rocks.

Much of this droughty soil is covered with scrubby forest or is idle, but a small acreage is used for hay, pasture, and other crops. If the soil is heavily limed and fertilized, it is fairly well suited to alfalfa. Unless water is applied through irrigation, however, the soil is poorly suited to general crops, hay, and pasture. Fields that are irrigated and well fertilized can be used for early sweet corn and early vegetables. (Capability unit IIIs–2; woodland suitability group 6; urban group 1)

Hinckley gravelly sandy loam, 3 to 15 percent slopes (HkC).—This soil has the profile described as typical for the series. The soil is in areas widely scattered through the river valleys of the county. Its slopes are broken and irregular. It is droughty, is rapidly permeable, and has low available moisture capacity. Included in mapping, in the town of Woodbury, are small areas where the soil has a reddish-brown profile because it has been influenced by reddish-brown Triassic rocks.

Hinckley gravelly sandy loam, 3 to 15 percent slopes, is commonly in cutover forest. Some areas have been cleared, and these are used mainly for hay and pasture or are idle. The soil is so droughty and irregularly sloping that it is poorly suited to general farm crops. It is fairly well suited to alfalfa but is poorly suited to hay and pasture. Even if the soil is irrigated, it produces a good growth of crops only if fertilization is heavy and frequent. Slopes generally are too irregular for contour cultivation, terraces, and stripcropping. (Capability unit IIIse–1; woodland suitability group 6; urban group 1)

Hinckley gravelly loamy sand, 0 to 3 percent slopes (HmA).—This inextensive soil is in widely scattered areas. It is very rapidly permeable and has very low available moisture capacity. Cutover forest covers most of the acreage, but some areas have been cleared and are used for pasture and hay or are idle. The soil is only fairly well suited to alfalfa. Unless it is irrigated and heavily fertilized, it is poorly suited to general farm crops, hay, and pasture. Soil blowing is a hazard in unprotected fields. (Capability unit IIIs–1; woodland suitability group 6; urban group 1)

Hinckley gravelly loamy sand, 3 to 15 percent slopes (HmC).—This soil is in scattered areas of irregular or broken slopes (fig. 9). It is mostly in cutover forest, but in some places it has been cleared and is pastured or idle. Alfalfa grows fairly well if lime and fertilizer are used. Unless the soil is irrigated and heavily fertilized, however, it is poorly suited to general farm crops, hay, and pasture. Unprotected areas are subject to water erosion and soil blowing. (Capability unit IVse–1; woodland suitability group 6; urban group 1)

Hollis Series

The Hollis series consists of well-drained or somewhat excessively drained, gently sloping to steep soils that are very shallow or shallow over crystalline bedrock, including schist and gneiss. These soils developed in a thin mantle of glacial till and the underlying residuum derived from bedrock. They are the most extensive soils in Litchfield County. Their permeability is moderate or moderately rapid.

A typical profile in a forested area has a surface layer of very dark grayish-brown fine sandy loam about 1 inch thick. The subsoil is dark yellowish-brown, yellowish-brown, or light olive-brown fine sandy loam. The depth to schist bedrock is 15 inches. Outcrops occupy as much as 50 percent of the surface area, and stones and angular rock fragments are common.

Typical profile of Hollis very rocky fine sandy loam, 3 to 15 percent slopes, in a forested area one-half mile west of the intersection of Nettletown Hollow Road and Route 132 in the town of Bethlehem:

O1—2½ inches to 1 inch, raw leaf litter and twigs from hardwoods.

O2—1 inch to 0, decomposed and partly decomposed litter of leaves and twigs; grades into a mat of organic material intertwined with roots.

A1—0 to 1 inch, very dark grayish-brown (10YR 3/2) fine sandy loam; weak, medium to fine, granular structure; very friable; numerous fine and medium roots; coarse fragments about 10 percent; extremely acid; clear, wavy boundary.

B21—1 inch to 8 inches, dark yellowish-brown (10YR 4/4) fine sandy loam; structureless (massive), and can be crushed to irregularly shaped clods; very friable; many medium roots; coarse fragments about 15 percent; very strongly acid; gradual, wavy boundary.

B22—8 to 12 inches, yellowish-brown (10YR 5/6) fine sandy loam; structureless (massive), and can be crushed to irregularly shaped clods; very friable; few medium roots; coarse fragments about 15 percent; very strongly acid; gradual, wavy boundary.

B3—12 to 15 inches, light olive-brown (2.5Y 5/4) fine sandy loam containing flat fragments of schist or gneissoid schist; very friable; no roots observed; coarse fragments about 15 percent; very strongly acid; abrupt boundary.

R—15 inches +, schist bedrock.

The depth of the soil between outcrops of bedrock ranges from a few inches to about 20 inches. A thin C horizon occurs in a few places. Bedrock crops out in places ranging from few to many, and the surface area covered by these outcrops ranges from 5 to 50 percent. Where rock exposures cover more than 50 percent of the surface, the area is classified as Rock land, a miscellaneous land type.

The color of the Ap horizon normally is very dark grayish brown (10YR 3/2). In the B2 horizon, hue is 7.5YR to 10YR, value is 4 to 5, and chroma is 4 to 6. Where present, the C horizon has a hue of 2.5Y.

The Hollis soils commonly are near the deep, well drained Charlton soils, the deep, moderately well drained Sutton soils, the poorly drained Leicester soils, and the very poorly drained Whitman soils. Hollis soils resemble the Shapleigh soils in their shallowness to bedrock, but they are not so coarse textured as those soils.

Hollis rocky fine sandy loam, 3 to 15 percent slopes (HoC).—This soil is in scattered areas that make up only a small total acreage. The profile is similar to the one described as typical for the series, but bedrock is exposed in fewer places. Most of the exposed bedrock is flush with the surface. Although the available moisture capac-

Figure 9.—**A kame that is occupied by Hinckley gravelly loamy sand, 3 to 15 percent slopes.**

ity is moderate, shallowness limits the moisture reserve for roots (fig. 10). Included with this soil in mapping are small areas of Sutton, Charlton, and Shapleigh soils. Also included are small areas of soils that are yellowish red in the surface layer and subsoil.

Most of this soil is in cutover forest, but some of the acreage has been cleared and is idle or used for hay and pasture. These crops are fairly suitable. Woodland and wildlife habitat are other suitable uses. (Capability unit VIs-3; woodland suitability group 9; urban group 10)

Hollis very rocky fine sandy loam, 3 to 15 percent slopes (HrC).—A profile of this soil is described as typical for the series. The soil is common and widely distributed in the county, except in the limestone areas. It is moderately permeable and has moderate available moisture capacity, but shallowness to bedrock limits the moisture reserve for roots. Included in mapping are small areas of Shapleigh soils and small areas in which the surface layer and subsoil are colored yellowish red.

This soil generally is unsuitable for cultivation because of shallowness, exposed bedrock, and in places, loose stones on the surface. Most of the acreage is wooded. Cleared areas are used mainly for unimproved pasture or are idle. Small areas are in hay or improved pasture. The soil is suitable as woodland, unimproved pasture, or habitat for wildlife. (Capability unit VIs-3; woodland suitability group 9; urban group 10)

Hollis very rocky fine sandy loam, 15 to 35 percent slopes (HrE).—This soil is strongly sloping, hilly, or steep. It occurs most commonly in the northern and western parts of the county, but some of the acreage is in the eastern part. Included in mapping are small areas of Charlton, Sutton, and Shapleigh soils. Also included are small areas in which the surface layer and subsoil are yellowish red.

The use of this soil is limited by slope, droughtiness, rock outcrops, and stones and boulders on the surface. Most of the acreage is wooded, though some areas have been cleared and are used for unimproved pasture or are idle. The soil is suitable as woodland, unimproved pas-

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Figure 10.—**Profile of Hollis rocky fine sandy loam, 3 to 15 percent slopes.**

ture, or habitat for wildlife. (Capability unit VIIs-3; woodland suitability group 10; urban group 10)

Hollis extremely rocky fine sandy loam, 3 to 15 percent slopes (HxC).—This soil has more exposed bedrock and generally more loose stones on the surface than very rocky Hollis soils. It lies in small to moderately large areas that are widely distributed through the uplands, except in the limestone area of the county in the northwestern part. Small areas included in mapping are yellowish red in the surface layer and subsoil.

This soil is too rocky and too droughty for cultivated crops, but it is suited to trees, unimproved pasture, and wildlife habitat. It is mainly forested, though some areas have been cleared and are pastured or idle. (Capability unit VIIs-3; woodland suitability group 9; urban group 10)

Hollis extremely rocky fine sandy loam, 15 to 35 percent slopes (HxE).—This soil is extensive and widely distributed through the hillier parts of the county. It is used principally as woodland and should be managed for this use, or for recreation or wildlife habitat. Management that requires using any kind of equipment is difficult because of rockiness and slope. (Capability unit VIIs-3; woodland suitability group 10; urban group 10)

Holyoke Series

The Holyoke series is made up of gently sloping to steep soils that are very shallow or shallow over basalt or diabase bedrock. These soils developed in a thin mantle of glacial till or other deposits. In Litchfield County they occur only in the town of Woodbury. Outcrops of bedrock occupy as much as 50 percent of the surface area. Permeability of the soil material is moderate.

A typical profile in a forested area has a surface layer of dark-brown silt loam about 1 inch thick. The subsoil consists of silt loam that is dark brown or brown in the upper part and yellowish red in the lower part. The depth to diabase bedrock is about 16 inches.

Typical profile of Holyoke very rocky silt loam, 3 to 15 percent slopes, in a wooded area 0.3 mile north of the Orenaug Park Road entrance in the Orenaug Rocks Lookout Tower, town of Woodbury:

O1—3 inches to ½ inch, fresh litter from deciduous trees.
O2—½ inch to 0, decomposed litter.
A1—0 to 1 inch, dark-brown (10YR 3/3) silt loam; weak, medium, granular structure; very friable; numerous fine roots; clear, smooth boundary.
B21—1 inch to 7 inches, dark-brown to brown (7.5YR 4/4) silt loam; weak, coarse, granular structure; very friable; many fine roots; coarse fragments about 10 percent; very strongly acid; gradual, wavy boundary.
B22—7 to 16 inches, yellowish-red (5YR 4/6) silt loam; weak, medium, subangular blocky structure; very friable; roots common; coarse fragments 15 to 20 percent; strongly acid; abrupt boundary. Flat rock fragments are common in the solum.
R—16 inches +, diabase bedrock.

Angular fragments of rock are common and make up 5 to 30 percent of the solum. Depth to bedrock ranges from a few inches to 20 inches. The color of the A1, or the Ap, horizon ranges from dark brown (7.5YR 3/3 or 10YR 3/3) to brown (7.5YR 4/2). The B horizon generally is brown (7.5YR 4/4) in the upper part and reddish brown (5YR 4/4) or yellowish red (5YR 4/6) in the lower part.

The Holyoke soils differ from the Shapleigh and Hollis soils in texture and color. They are silt loam throughout, whereas the Shapleigh soils are sandy loam to loamy sand and the Hollis soils are fine sandy loam.

Holyoke very rocky silt loam, 3 to 15 percent slopes (HyC).—A profile of this soil is the one described as typical for the series. The soil, which occupies only a small acreage, is unsuited to cultivated crops because of loose stones and outcropping bedrock. Although the soil has been cleared in some areas, most of it is forested. Cleared areas are idle or in housing developments. Also, small tracts are used for quarries. Woodland, recreation, and wildlife habitat are among the suitable uses for this soil. (Capability unit VIs-3; woodland suitability group 9; urban group 10)

Holyoke extremely rocky silt loam, 15 to 35 percent slopes (HzE).—This soil is inextensive and mostly wooded. Some of the acreage is used for parks and other recreational facilities, and these are good uses. Other good uses are woodland and wildlife habitat. Unfavorable slopes, surface stones, and outcrops of bedrock make the soil unsuitable to cultivated crops. Included in mapping are a few small areas of Rock land, a miscellaneous land type in which more than 50 percent of the surface consists of bedrock. (Capability unit VIIs-3; woodland suitability group 10; urban group 10)

Kendaia Series

The Kendaia series consists of nearly level, poorly drained soils that developed in firm, calcareous glacial till. The till was derived chiefly from Stockbridge limestone and Salisbury schist but, to a small extent, from dolomitic limestone and quartzite. These soils are in small to medium-sized areas throughout the limestone valley, and they also occur in isolated areas in the towns of Goshen, Cornwall, and Kent. Their permeability is moderate in the surface layer and subsoil but is slow in the substratum.

A typical profile in a cultivated area has a surface layer of friable, very dark gray silt loam about 7 inches thick. The subsoil is silt loam in the upper part and gravelly silt loam in the lower part. It is olive gray but contains distinct mottles of olive brown, yellowish brown, and similar colors. This layer extends to a depth of 24 inches. The substratum is olive-gray and dark grayish-brown silt loam that is commonly mottled with shades of brown and gray. The substratum contains many fragments of limestone and is calcareous.

Typical profile of Kendaia silt loam in a pastured field 0.7 mile east of the intersection of Benton Hill Road and Route 41, town of Sharon:

Ap—0 to 7 inches, very dark gray (10YR 3/1) silt loam; weak, medium and fine, granular structure; friable; numerous fine roots; coarse fragments less than 5 percent; neutral; clear, smooth boundary.

B21g—7 to 12 inches, olive-gray (5Y 5/2) silt loam; common, medium, distinct mottles of light olive brown (2.5Y 5/6) and dark yellowish brown (10YR 4/4); weak, thick, platy structure that can be crushed to subangular blocky structure; friable; few fine roots; gradual, wavy boundary.

B22g—12 to 24 inches, olive-gray (5Y 5/2) gravelly silt loam; common, medium and fine, distinct mottles of dark yellowish brown (10YR 4/4) and light olive brown (2.5Y 5/4); weak, thick and medium, platy structure; slightly firm; numerous, leached, pale-yellow to light-gray (2.5Y 7/4–7/2) limestone fragments; no roots observed; coarse fragments 20 percent; calcareous; gradual, wavy boundary.

C1g—24 to 32 inches, olive-gray (5Y 4/2) silt loam; common, fine, faint to distinct mottles of dark yellowish brown (10YR 4/4), light olive brown (2.5Y 5/6) and greenish gray (5GY 5/1); weak, thick, platy structure; firm to very firm; coarse fragments about 15 percent; calcareous; gradual, wavy boundary.

C2—32 to 48 inches, dark grayish-brown (2.5Y 4/2) silt loam; common, medium, distinct mottles of light olive brown (2.5Y 5/4), gray (5Y 5/1), and greenish gray (5GY 5/1); weak, thick, platy structure; firm to very firm; coarse fragments about 15 percent, consisting largely of limestone and schist; strongly calcareous.

The texture of the B horizon is silt loam or loam. Coarse fragments make up 5 to 20 percent of the solum and 15 to 35 percent of the C horizon. The solum ranges from 20 to 30 inches in thickness and is slightly acid or neutral. Depth to carbonates ranges from 12 to 26 inches.

Color of the A1, or Ap, horizon is very dark gray (10YR 3/1) or very dark grayish brown (10YR 3/2). In the B horizon the hue ranges from 10YR to 5Y, the value is generally 5, and the chroma is 2 to 3. The C horizon has a hue of 2.5Y to 5Y, a value of 4, and a chroma of 2 or less.

Generally, the Kendaia soils are downslope from the Stockbridge soils, the Dover soils, and the moderately well drained Amenia soils. They also lie near the Farmington soils, which are shallow to limestone bedrock. The Kendaia soils are similar to the Ridgebury soils in drainage, but they developed in firm, calcareous glacial till, whereas the Ridgebury developed in acid, very firm, moderately coarse textured till.

Kendaia silt loam (Ka).—This soil has the profile described as typical for the series. Permeability is moderate, but a fluctuating water table restricts internal drainage in winter and early in spring.

A large acreage of this soil is in cutover forest. Some areas have been cleared, and these are used for pasture and hay or are idle. Pasture can be improved by partly draining the soil, using fertilizer, and controlling brush. If drainage is adequate, hay and silage corn can be grown. Undrained, the soil is suited to trees, pasture, and wildlife habitat. (Capability unit IIIw-1; woodland suitability group 4; urban group 11)

Kendaia-Lyons very stony silt loams (Ke).—This complex is inextensive; it occupies small areas scattered through the limestone valley. Both soils are wet and very stony, and there is little difference in their management needs.

These soils are used for woodland, wildlife habitat, and unimproved pasture, and they are suited to these uses. Pasture can be improved by controlling brush and, where practical, by applying fertilizer. Fertilization stimulates growth of native grasses and legumes, and these plants provide fair grazing in dry periods. (Capability unit VIIs-4; woodland suitability group 5; urban group 11)

Leicester Series

The Leicester series consists of poorly drained or somewhat poorly drained soils that developed in very friable to firm glacial till of Late Wisconsin age. The till was derived mostly from schist, gneiss, and granite but included small amounts of quartzite and other rocks. These soils occupy wet, low-lying areas. They are widely distributed throughout the county except in the limestone section in the northwestern part. Their permeability is moderate in the surface layer and subsoil and is moderately rapid in the substratum.

A typical profile in an undisturbed forested area has a surface layer of black, very friable fine sandy loam that is about 6 inches thick and is high in organic-matter content. The upper part of the subsoil is grayish-brown fine sandy loam that contains mottles of dark yellowish brown, brown, and light brownish gray. The lower part is olive-gray sandy loam, and it contains similar mottles. This layer extends to a depth of 25 inches. It is underlain by a substratum of grayish-brown gravelly sandy loam that is mottled with brown and light olive gray. This material shows fewer mottles than the subsoil.

Typical profile of Leicester very stony fine sandy loam in a wooded area, 0.7 mile north of Bakersville on the west side of Eisendrath Road in the town of New Hartford:

O1—2½ inches to 1 inch, undecomposed and fresh litter from deciduous trees and hemlock.

O2—1 inch to 0, decomposed litter from the same kinds of trees.

A1—0 to 6 inches, black (10YR 2/1) fine sandy loam; weak, medium, granular structure; very friable; numerous fine roots; coarse fragments 5 to 10 percent; strongly acid; clear, wavy boundary.

B21—6 to 16 inches, grayish-brown (2.5Y 5/2) fine sandy loam; many mottles of dark yellowish brown (10YR 4/4), brown (7.5YR 4/4), and light brownish gray (2.5Y 6/2); structureless (massive), but breaking into soft, subangular clods; friable; few fine roots; coarse fragments about 10 percent; strongly acid; gradual, wavy boundary.

B22—16 to 25 inches, olive-gray (5Y 5/2) sandy loam; many mottles of dark yellowish brown (10YR 4/4), brown (7.5YR 4/4), and light brownish gray (2.5Y 6/2); structureless (massive), but breaking into soft, subangular clods; friable; no roots observed; coarse fragments about 15 percent; strongly acid; gradual, wavy boundary.

C—25 to 42 inches, grayish-brown (2.5Y 5/2) gravelly sandy loam; common to few mottles of brown (7.5YR 4/4) and light olive gray (5Y 6/2); structureless (massive); firm in place but friable when removed; coarse fragments about 25 percent; strongly acid.

The texture of the solum is dominantly fine sandy loam, but in places it grades to sandy loam in the lower part. In some places the texture of the A horizon has been influenced by silty material laid down by wind. The C horizon generally is gravelly and is fine sandy loam, sandy loam, or loamy sand. Coarse fragments make up 5 to 25 percent of the solum, but the percentage of coarse fragments commonly is higher in the C horizon. In some places there are lenses of coarse sand or loamy sand in the lower B horizon and the C horizon. The clay content is low, normally less than 6 percent. The C horizon is friable to firm in place. Lenses of very firm material may occur in the C horizon. The thickness of the solum ranges from 18 to 28 inches.

The quantity of surface stones ranges from nearly none in some cleared areas to many in uncleared areas.

The A1 horizon is 4 to 6 inches thick and has a hue of 10YR, a value of 2 to 3, and a chroma of 1 to 2. In the B horizon the matrix has a hue ranging from 10YR to 5Y, a value of 5 to 6, and a chroma of 2 or less. The C horizon is 10YR to 5Y in hue; it contains mottles that are similar to those of the B horizon but are less numerous.

The Leicester soils are near the Charlton soils, the Gloucester soils, the moderately well drained Sutton soils, and the very poorly drained Whitman soils. The Leicester soils are somewhat similar to the poorly drained Ridgebury soils, but unlike those soils, they lack a hard compact layer at a depth of 18 to 24 inches. They are more acid than the Kendaia soils, which formed in calcareous materials.

Leicester fine sandy loam (Lc).—Except for its surface layer that is nearly free of stones, this soil has a profile that is similar to the one described as typical for the series. It occurs in small scattered areas and generally is undrained. Permeability is moderate, but a fluctuating water table is within 8 inches of the surface in winter and early in spring. Because the soil is nearly level, it has slow or very slow runoff.

Some of the acreage is in cutover forest, and some has been cleared. In undrained areas the soil is used for pasture or is idle. If drained, it is well suited to improved pasture and is fairly well suited to silage corn. Where outlets are available, drainage can be improved by tiling or open ditching. Wildlife habitat is another good use for this soil. (Capability unit IIIw-1; woodland suitability group 4; urban group 11)

Leicester stony fine sandy loam (Le).—Surface stones and poor drainage limit the use of this soil for farming. A large part of the acreage is in cutover forest, but some areas have been cleared and are used mainly for unimproved pasture or are idle. Pasture is improved if the soil is partly drained, limed and fertilized, and cleared of brush. Wildlife habitat can be developed on this soil. (Capability unit Vws-2; woodland suitability group 4; urban group 11)

Leicester, Ridgebury and Whitman very stony fine sandy loams (Lg).—This undifferentiated unit is made up of poorly drained Leicester and Ridgebury soils and a very poorly drained Whitman soil. All of these soils are nearly level and very stony. They occur in intricate patterns, and they are similar enough in behavior that their separation is not important for the objectives of the survey.

Stones and excess water make these soils unsuitable for cultivation. Forest covers most of the acreage, but scattered areas have been cleared and are used for unimproved pasture (fig. 11) or are idle. Where feasible, the growth of native grasses and legumes in pasture can be increased by controlling brush and applying lime and fertilizer. Grazing is fair in dry periods. The soils are suitable as habitat for wildlife. (Capability unit VIIs-4; woodland sutability group 5; urban group 11)

Figure 11.—**Pasture on Whitman very stony fine sandy loam. In the background, some of the stones have been cleared from Ridgebury and Whitman soils.**

Limerick Series

The Limerick series consists of poorly drained soils that developed in medium acid to neutral sediments deposited on flood plains along the major rivers. The sediments were derived mainly from schist and limestone but included material from gneiss and other rocks. Limerick soils occur in areas of medium size along the Housatonic River and its tributaries. They are moderately permeable throughout.

In a typical profile the surface layer is very dark brown silt loam about 9 inches thick. Just below is friable, grayish-brown and olive-gray silt loam that is mottled with dark yellowish brown and various shades of gray. This underlying material extends to a depth of 46 inches or more. It includes lenses of very fine sand and loamy fine sand.

Typical profile of Limerick silt loam in a cultivated field on the north side of Route 126 and 0.8 mile west

of the intersection of Routes 63 and 126 in the town of Canaan:

Ap—0 to 9 inches, very dark brown (10YR 2/2) silt loam; weak, medium, granular structure; friable but slightly compacted; some fine roots; medium acid; abrupt, smooth boundary.

C1—9 to 22 inches, grayish-brown (2.5Y 5/2) silt loam; many, medium, distinct mottles of dark yellowish brown (10YR 4/4) and olive gray (5Y 5/2); structureless (massive), breaking into medium subangular clods; friable; few fine roots; medium acid; gradual, wavy boundary.

C2—22 to 32 inches, grayish-brown (2.5Y 5/2) silt loam; lenses of very fine sand; common, medium, distinct mottles of dark yellowish brown (10YR 4/4), olive gray (5Y 5/2), and light olive gray (5Y 6/2); structureless (massive), breaking into medium subangular clods; friable when removed but somewhat firm in place; slightly acid; gradual, wavy boundary.

C3—32 to 46 inches, olive-gray (5Y 5/2) silt loam; lenses of loamy fine sand; mottles of dark yellowish brown (10YR 4/4) and gray (5Y 5/1); structureless (massive); friable; neutral.

The texture is dominantly silt loam but in some areas is very fine sandy loam. Lenses of loamy sand, sandy loam, or clay loam, as well as a buried surface horizon or layers of muck, are not uncommon below a depth of 30 inches. In the valley of the Housatonic River, the texture normally is uniform to a greater depth than it is in other places. Generally, the A horizon is 6 to 9 inches thick. The profile is medium acid to neutral.

The A horizon ordinarily has a hue of 10YR. Value in this horizon is 2 to 3, and chroma is 1 to 2. In the C horizon, hue of the matrix is 10YR to 5Y, value is 4 to 6, and chroma is 2 to 3. If a buried surface horizon occurs, it is black or very dark grayish-brown (10YR 2/1–3/2). Mottles have a hue ranging from 7.5YR to 5Y.

The Limerick soils occur closely with the well drained Genesee soils, the moderately well drained Eel soils, and the very poorly drained Saco soils. Limerick soils are finer textured than the poorly drained Rumney soils.

Limerick silt loam (0 to 3 percent slopes) (Lm).—This soil is moderately permeable and has high available moisture capacity. Unless the soil is drained, however, its internal drainage is restricted by a seasonal high water table. Undrained areas are saturated in winter and spring. Because flooding is frequent and suitable outlets are lacking, it is generally not practical to improve drainage for crops that require intensive cultivation. Included in areas mapped as this soil are small areas that are strongly acid and small areas that are underlain by sand and gravel at a depth of 24 to 30 inches.

In areas cleared but undrained, this soil is fairly suitable for pasture. Partly drained areas can be used for hay and pasture, and adequately drained areas are suitable for silage corn. Controlling brush, applying fertilizer, and avoiding overgrazing will increase the growth of forage plants in pasture. This soil is suitable for wildlife. (Capability unit IIIw–2; woodland suitability group 4; urban group 13)

Lyons Series

The Lyons series consists of very poorly drained, nearly level soils that formed in calcareous glacial till derived mainly from crystalline limestone and Salisbury schist. These soils occur in small areas scattered throughout the limestone valley. They are moderately permeable in the surface layer and subsoil and are slowly or very slowly permeable in the substratum.

A typical profile has a black silt loam surface layer about 8 inches thick. The subsoil is gray loam that contains mottles of yellowish brown and strong brown. It extends to a depth of about 22 inches. The substratum is gray gravelly loam that is firm and calcareous.

Typical profile of Lyons silt loam in a brushy pasture 0.8 mile west of Hamlin Pond on Sharon Mountain Road in the town of Sharon:

A1—0 to 8 inches, black (10YR 2/1) silt loam; weak, fine, granular structure; friable, coarse fragments about 5 percent; strongly acid; clear, wavy boundary.

A2g—8 to 18 inches, gray (5Y 5/1) gravelly loam; few, medium, faint mottles of light olive brown (2.5Y 5/4); weak, thick, platy structure; friable; coarse fragments about 20 percent; these fragments consist largely of Salisbury schist and some quartzite; neutral; clear, wavy boundary.

B2g—18 to 22 inches, gray (5Y 6/1) loam; many, medium, prominent mottles of yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6); weak, thick, platy structure; friable; coarse fragments about 15 percent; neutral; gradual, wavy boundary.

C1g—22 to 26 inches, gray (5Y 5/1) gravelly loam; few, fine, faint mottles of olive (5Y 5/3); weak, thick, platy structure that crushes to weak, subangular blocky structure; firm; coarse fragments about 20 percent; weakly calcareous; gradual wavy boundary.

C2g—26 to 40 inches, gray (5Y 5/1) gravelly loam; a few (5Y 5/4) mottles; structureless (massive); firm; coarse fragments about 20 percent; strongly calcareous.

The Lyons soils in Litchfield County have a thicker A horizon and, as indicated by grayer colors, are more poorly drained than soils of this series in other survey areas.

The texture below the A horizon is silt loam or loam. The clay content generally is 18 to 22 percent. Coarse fragments make up as much as 25 percent of the solum in some places, but ordinarily the content of coarse fragments ranges between 5 and 20 percent. In most places the amount of fragments is greater in the C horizon. Thickness of the solum generally is 22 to 24 inches, and the depth to carbonates ranges from 16 to 30 inches.

The A1 horizon is black (10YR 2/1) or very dark gray (10YR 3/1). In the B horizon the hue is 2.5Y to 5Y, the value is 5 to 6, and the chroma is 0 to 3. Mottles have a hue ranging from 7.5YR to 5Y. The A2g horizon generally is completely gleyed and contains few or no mottles.

The Lyons soils are near the well drained Stockbridge and Dover soils, the moderately well drained Amenia soils, and the poorly drained Kendaia soils. They also occur near the Farmington soils, which are shallow to bedrock. The very stony Lyons soils are mapped in a complex with the very stony Kendaia soils. This complex is described under the heading "Kendaia Series."

Lyons silt loam (0 to 3 percent slopes) (Ly).—This soil is inextensive and, because it is very poorly drained, is of limited use for farming. Cleared areas are used mainly for pasture or are idle. Where the soil has been partly drained, it is suitable for improved pasture. If drainage is adequate, silage corn and hay can be grown. The soil also is suitable as habitat for wildlife. (Capability unit Vw–1; woodland suitability group 5; urban group 12)

Made Land

Made land (Ma) consists of filled areas and dumps where trashy material occurs with a varying amount of earthy material. The trashy material includes old brick, plaster,

and tin cans. Because the land is extremely variable, it is generally not suitable for farming, though some areas can be used for wildlife. (Woodland suitability group 11; capability unit and urban group not assigned)

Merrimac Series

The soils in the Merrimac series are nearly level to sloping and somewhat excessively drained. At a depth of about 2 feet, they are underlain by stratified sand and gravel that were derived mainly from granite, gneiss, schist, and quartzite. These soils occupy scattered areas on terraces throughout the valleys of the county. Their permeability is moderately rapid in the surface layer and subsoil and is rapid in the substratum.

A typical profile in a forested area that was formerly cultivated has a surface layer of very dark grayish-brown sandy loam about 2 inches thick. Underlying this layer is an old plow layer of dark-brown sandy loam about 5 inches thick. The upper part of the subsoil is sandy loam that is strong brown above but fades with depth to dark yellowish brown. The lower part of the subsoil is dark yellowish-brown to brown gravelly loamy sand. It extends to a depth of about 26 inches. The substratum is loose sand and gravel containing a few cobblestones in places.

Typical profile of Merrimac sandy loam, 3 to 8 percent slopes, in a wooded area 300 feet southeast of the northern end of Rugg Brook Reservoir in the town of Winchester:

O1—3 inches to 1 inch, fresh litter consisting of leaves and twigs of deciduous trees and white pine needles.

O2—1 inch to 0, decomposed and partly decomposed organic materials.

A1—0 to 2 inches, very dark grayish-brown (10YR 3/2) sandy loam; weak, coarse, granular structure; very friable; numerous fine and medium roots; coarse fragments about 5 percent; strongly acid; clear, wavy boundary.

Ap—2 to 7 inches, dark-brown (10YR 3/3) sandy loam; weak, coarse, granular structure; very friable; numerous fine roots; coarse fragments about 5 percent; strongly acid; clear, wavy boundary.

B21—7 to 16 inches, strong-brown (7.5YR 5/6) sandy loam; structureless (massive), but breaking into soft clods; very friable; few medium and fine roots; coarse fragments about 10 percent; medium acid; clear, wavy boundary.

B22—16 to 22 inches, dark yellowish-brown (10YR 4/4) light sandy loam; structureless (massive), but breaking into soft clods; very friable; few fine roots; coarse fragments about 15 percent; medium acid; gradual, wavy boundary.

B23—22 to 26 inches, dark yellowish-brown (10YR 4/4) to brown (10YR 5/3) gravelly loamy sand; structureless (single grain); loose; no roots observed; coarse fragments about 25 percent; strongly acid; clear, wavy boundary.

C—26 to 40 inches, grayish-brown (2.5Y 5/2) sand, gravel, and cobblestones; structureless (single grain); loose; no roots observed; coarse fragments about 50 percent; strongly acid.

Below a depth of about 16 inches, the texture of the B horizon ranges from light sandy loam to gravelly sandy loam or gravelly loamy sand. The depth to stratified sand, gravel, and cobblestones ranges from 18 to 30 inches. By volume, the percentage of gravel is 5 to 30 percent in the solum and is 35 to 65 percent in the C horizon.

The Ap horizon generally has a hue of 10YR, value of 3 to 4, and chroma of 2 to 3. The colors of the B horizon fade with depth. In the upper part of the B horizon the hue is 7.5YR or 10YR, the value is 4 to 6, and the chroma is 3 to 8. The lower part of the B horizon is somewhat paler and generally has a hue of 10YR. For this part of the B horizon, value and chroma have the same range as those in the upper part.

The Merrimac soils are near the excessively drained Hinckley soils, the moderately well drained Sudbury soils, the poorly drained Walpole soils, and the very poorly drained Scarboro soils. They also are near the Windsor and Hartland soils. The solum of the Merrimac soils is thicker and generally contains less gravel than that of the Hinckley soils. In contrast to the Merrimac soils, the Enfield soils developed in a silt mantle over stratified sand and gravel, and the Copake soils developed over stratified sandy and gravelly material containing limestone.

Merrimac sandy loam, 0 to 3 percent slopes (MyA).—This soil is rapidly permeable and has moderately low available moisture capacity. It is somewhat droughty and, unless irrigated, commonly holds too little moisture available for plants. Nevertheless, the soil warms up early in spring, is free of surface stones, and is easy to work. Surface runoff is slow, but soil blowing is likely in fields that are left unprotected in spring. Included in mapping are small areas where the surface layer is fine sandy loam and small areas of reddish-brown soils that developed in materials derived from reddish Triassic rocks. These inclusions are in the southern part of the town of Woodbury.

In most places this soil has been cleared and is used for pasture and cultivated crops. Some areas are in cutover forest, some are in housing developments, and others are idle. The soil is fairly suitable for alfalfa, silage corn, hay, and pasture. Shallow-rooted crops, however, are affected by insufficient moisture sooner than deep-rooted ones. (Capability unit IIs-1; woodland suitability group 6; urban group 1)

Merrimac sandy loam, 3 to 8 percent slopes (MyB).—This soil has the profile described as typical for the series. Permeability is rapid, and the available moisture capacity is moderately low. Unless irrigation water is applied, crops lack sufficient moisture in most growing seasons, as the soil is somewhat droughty. It warms up rapidly in spring, is free of surface stones, and is easily worked. Included in mapping are scattered areas in which the surface layer is fine sandy loam and, in the town of Woodbury, a few areas where the profile is reddish brown.

Much of this soil has been cleared and is used for cultivated crops. Some areas are in cutover forest, in housing developments, or idle. The soil is used for alfalfa, silage corn (fig. 12), hay, and pasture, and it is fairly suitable for these crops. In dry periods, when moisture is insufficient, shallow-rooted crops are more likely to be damaged than deep-rooted ones. Because leaching of nutrients is fairly rapid, fertilizer should be applied liberally. Unprotected areas are subject to soil blowing and water erosion, but simple measures are adequate for controlling runoff. (Capability unit IIs-2; woodland suitability group 6; urban group 1)

Merrimac sandy loam 8 to 15 percent slopes (MyC).—This soil has more rapid runoff than other Merrimac soils, and more intensive management is needed for controlling erosion. Much of the acreage is in cutover forest, and the rest is used for crops or is idle. The soil is fairly well suited to alfalfa, but it is poorly suited to silage

Figure 12.—**A field of corn on Merrimac sandy loam, 3 to 8 percent slopes, on a terrace along the Housatonic River.**

corn and to shallow-rooted legumes and grasses. Small areas included in mapping have a fine sandy loam surface layer. (Capability unit IIIe-3; woodland suitability group 6; urban group 2)

Muck, Shallow

Muck, shallow (Pm) lies in small, shallow bogs and around the edges of larger bogs. It consists of well-decomposed organic materials that are 18 to 36 inches thick. Most of the acreage is in cutover forest, but small areas have been cleared and are used for hay and pasture or are idle. (Capability unit VIw-1; woodland suitability group 5; urban group 12)

Ondawa Series

The Ondawa series consists of well-drained soils that formed in sediments derived from gneiss, granite, schist, and other rocks. These soils lie on flood plains along the major rivers and their tributaries, where flooding is a periodic hazard. The soils are moderately to rapidly permeable and have moderate available moisture capacity.

A typical profile in a cultivated area has a surface layer of very dark grayish-brown fine sandy loam about 9 inches thick. This layer overlies very friable, dark-brown sandy loam that extends to a depth of about 32 inches. Below this depth the material consists of dark grayish-brown gravel and coarse sand.

Typical profile of Ondawa fine sandy loam in a hayfield one-fourth mile northeast of the intersection of Flanders Road and U.S. Route 6, on the north side of U.S. Route 6, in North Woodbury:

Ap—0 to 9 inches, very dark grayish-brown (10YR 3/2) fine sandy loam; weak, medium and fine, granular structure; very friable; fine roots numerous; coarse fragments about 2 percent; strongly acid; clear, smooth boundary.

C1—9 to 32 inches, dark-brown (10YR 3/3) sandy loam; structureless (massive), and crushes readily to subangular clods; very friable; fine roots numerous; coarse fragments about 8 percent; strongly acid; abrupt, wavy boundary.

IIC2—32 to 42 inches, dark grayish-brown (10YR 4/2) gravel and coarse sand; structureless (single grain); loose; no roots observed; coarse fragments 30 to 40 percent; strongly acid; gravel consists largely of granite, gneiss, schist, and quartzite.

The C1 horizon extends to a depth of 30 to 32 inches and consists of fine sandy loam or sandy loam in which lenses of coarser textured material occur in places. The texture below a depth of 30 to 32 inches is variable; it ranges from sand and gravel in some places to fine sandy loam or sandy loam interbedded with sand and gravel in other places. The Ap, or A1, horizon has a hue of 10YR, a value of 3, and a chroma of 2 to 4. The C horizon varies in color but generally is 10YR in hue. The profile commonly shows an old buried soil having a very dark grayish-brown or darker surface horizon.

The Ondawa soils are in the same drainage sequence as the moderately well drained Podunk soils and the poorly drained Rumney soils. They also occur close to the Suncook soils, which are mainly loamy fine sand and loamy sand, and in many places they lie near the Hinckley, Merrimac, Gloucester, and Charlton soils. The Ondawa soils are coarser textured than the Genesee soils.

Ondawa fine sandy loam (0 to 3 percent slopes) (On).—This soil is stone free, dries out rapidly in spring, and is easy to work. Much of the acreage has been cleared, though some is wooded or idle. The soil is well suited to crops commonly grown in the county, but it is used mainly for hay and pasture because flooding is a hazard late in fall and early in spring. Silage corn is grown in a few places. Sudangrass, millet, and grass-legume mixtures grow well if they are properly limed and fertilized. Areas mapped as this soil include small areas of Podunk and Suncook soils, and there are scattered inclusions of soils that are underlain by limestone and are less acid than the Ondawa soils. (Capability unit IIw-4; woodland suitability group 2; urban group 13)

Paxton Series

The Paxton series is made up of well-drained soils that developed in glacial till derived principally from schistose rocks mixed with gneiss and granite. These soils have a compact layer, or fragipan, at a depth of about 2 feet. They commonly occupy smoothly rounded drumlins or drumloidal hills that were elongated in a north-south direction by moving glaciers. The drumlins occur in many parts of Litchfield County and are especially prominent in the towns of Litchfield, Morris, and Goshen. Permeability of the Paxton soils is moderate in the surface layer and subsoil but slow or very slow in the substratum.

A typical profile in a cultivated field has a surface layer of friable, very dark grayish-brown fine sandy loam about 8 inches thick. The upper part of the subsoil is dark yellowish-brown fine sandy loam, and the lower part is light olive-brown grading to grayish-brown fine sandy loam. At a depth of about 26 inches, the subsoil is underlain by a substratum of very firm, dark grayish-

brown gravelly fine sandy loam. This very firm layer is known locally as hardpan, and water passes through it slowly. It is hard and brittle when dry.

Typical profile of Paxton fine sandy loam, 3 to 8 percent slopes, in a cultivated area 1 mile south of the intersection of East Street and Route 4 in the town of Goshen:

Ap—0 to 8 inches, very dark grayish-brown (10YR 3/2) fine sandy loam; weak, coarse, granular structure; friable; fine numerous roots; coarse fragments about 10 percent; clear, smooth boundary.

B21—8 to 16 inches, dark yellowish-brown (10YR 4/4) fine sandy loam; very weak, medium, subangular blocky structure; friable; many fine roots; coarse fragments about 10 percent; strongly acid; clear, wavy boundary.

B22—16 to 24 inches, light olive-brown (2.5Y 5/4) fine sandy loam; structureless (massive), but breaks into soft, angular clods where disturbed; friable; few fine roots; coarse fragments about 15 percent; strongly acid to medium acid; clear, wavy boundary.

B23—24 to 26 inches, grayish-brown (2.5Y 5/2) fine sandy loam to sandy loam; very weak, medium, platy structrue; friable; few fine roots; coarse fragments about 15 percent; strongly acid to medium acid; clear, wavy boundary.

C1x—26 to 29 inches, dark grayish-brown (2.5Y 4/2) gravelly fine sandy loam; weak, medium, platy structure; very firm; strongly acid to medium acid; gradual, smooth boundary.

C2x—29 to 40 inches, olive-brown (2.5Y 4/4) gravelly fine sandy loam; weak, thick, platy structure; very firm; strongly acid.

Texture in the solum normally is fine sandy loam, but in places it grades toward loam or very sandy loam. The C horizon generally is gravelly sandy loam or fine sandy loam. The depth to the fragipan is normally 24 to 26 inches but ranges from 16 to 30 inches. Along the area of contact between the solum and the fragipan, a few faint mottles are present in some places. Also, a faint, discontinuous A'2 horizon occurs just above the fragipan in places.

The Ap horizon has a hue of 10YR, a value of 3 to 4, and a chroma of 2 to 4. The A1 horizon generally has a value of 3 and a chroma of 1 to 4. Hue in the upper part of the B horizon is normally 10YR, but in places it is 7.5YR. In the lower B horizon, hue ranges from 10YR to 2.5Y, value is 4 to 5, and chroma is 2 to 6. The C horizon has a hue of 2.5Y to 5Y, a value of 4 to 5, and a chroma of 2 to 4.

The Paxton soils occur closely with the moderately well drained Woodbridge soils, the somewhat poorly drained to poorly drained Ridgebury soils, and the very poorly drained Whitman soils. They also are near the Charlton and Hollis soils. The Paxton soils have a fragipan that is lacking in the Charlton soils and they are not shallow to bedrock like the Hollis soils.

Paxton fine sandy loam, 0 to 3 percent slopes (PbA).—This inextensive soil is in small, scattered areas that generally lie on the top of drumlins or drumloidal hills. Permeability is moderate in the surface layer and subsoil, but it is slow in the fragipan. The available moisture capacity is high. Surface runoff is slow, and there is little or no risk of erosion.

This soil is well suited to silage corn, alfalfa, grasses and other legumes for hay or pasture, and apple orchards. It is used principally for these crops. The soil can be farmed intensively if it is well managed. Alfalfa, though subject to frost heaving, grows well in fields that are properly limed and fertilized. (Capability unit I–2; woodland suitability group 2; urban group 5)

Paxton fine sandy loam, 3 to 8 percent slopes (PbB).—A profile of this soil is described as typical for the series. Internal drainage is restricted by a hard layer that occurs at a depth of about 2 feet, and the soil warms up rather slowly in spring. Nevertheless, it has high available moisture capacity and, during the growing season, usually holds enough water available for plants. Included in mapping, in the town of Woodbury, are small areas of reddish-brown soils and, in the town of New Milford, small scattered areas where the profile is silt loam. In addition, small inclusions are moderately eroded.

This soil is well suited to silage corn, alfalfa, grasses and other legumes for hay and pasture, and apple orchards. These are the principal crops grown, but some of the acreage is used for other crops. Alfalfa is subject to frost heaving, especially where management is poor, but it grows well in fields that are properly limed and fertilized. Farming can be intensive on this soil if crops are grown in a suitable rotation, if good tilth is maintained, and if erosion is controlled. (Capability unit IIe–2; woodland suitability group 2; urban group 5)

Paxton fine sandy loam, 3 to 8 percent slopes, eroded (PbB2).—This soil has a profile somewhat similar to that described as typical for the series, but it is thinner in the surface layer and subsoil because of erosion. Generally, the depth to the compact layer is only about 18 inches.

This soil is well suited to silage corn, alfalfa, grasses and other legumes for hay and pasture, and apple orchards. These crops are the principal ones, though others also are grown. Alfalfa is subject to frost heaving, but it grows well if properly limed and fertilized. The soil requires more careful management than Paxton fine sandy loam, 3 to 8 percent slopes. Practices are needed that promote good tilth, conserve moisture, control erosion, and regularly supply organic matter. (Capability unit IIe–2; woodland suitability group 2; urban group 5)

Paxton fine sandy loam, 8 to 15 percent slopes (PbC).—This soil is more susceptible to erosion than less sloping Paxton soils. Included with it in mapping, in the towns of New Milford and Woodbury, are small areas of soils that are silt loam through the profile.

This soil is used principally for hay, pasture, and orchards. In addition, some of the acreage is used for silage corn and other cultivated crops. In fields where the soil is cultivated, crops should be grown in a longer rotation and practices for controlling erosion should be more intensive than on Paxton fine sandy loam, 3 to 8 percent slopes. (Capability unit IIIe–2; woodland suitability group 2; urban group 6)

Paxton fine sandy loam, 8 to 15 percent slopes, eroded (PbC2).—Except for its thinner surface layer and subsoil, this soil has a profile that is similar to the one described as typical for the series. All the acreage has been cultivated at one time or another. Areas on side slopes have lost soil material through washing, and some of this material has accumulated at or near the bottom of slopes. Where the soil is eroded, it is only about 18 inches deep to a compact layer.

The use of this soil is severely limited by the erosion hazard. The soil is used mainly for hay, pasture, and orchards, but in some areas it is used for silage corn and other cultivated crops. Measures are needed that maintain good tilth, conserve moisture, check soil losses, and

provide regular additions of organic matter. (Capability unit IIIe-2; woodland suitability group 2; urban group 6)

Paxton fine sandy loam, 15 to 25 percent slopes (PbD).—This soil generally occurs in small narrow strips. Some of the acreage is in cutover forest, and some is idle. The soil is suited to orchard trees and to grasses and legumes grown as forage crops. Because it is so erodible, it is not suitable for cultivation unless crops are grown in a long rotation and unless practices for controlling erosion are intensive. Included in areas mapped as this soil are small areas of soils that have a silt loam surface layer and subsoil. (Capability unit IVe-2; woodland suitability group 3; urban group 7)

Paxton fine sandy loam, 15 to 25 percent slopes, eroded (PbD2).—This soil is thinner in the surface layer and subsoil than noneroded Paxton soils having similar slopes. Some of the original surface layer, including organic matter, has been washed away. Because of slope and the erosion hazard, the soil is not suited to tilled crops, not even if these are grown in long rotations. Suitable uses include hay, pasture, and woodland. Good management is necessary to improve fertility and to control soil losses. (Capability unit IVe-2; woodland suitability group 3; urban group 7)

Paxton fine sandy loam, 25 to 35 percent slopes (PbE).—Most of this soil is in cutover forest, but small areas have been cleared and are pastured or idle. Using modern farm machinery is difficult because slopes are steep and erosion is a severe hazard. Consequently, the soil is not suitable for cultivation. It can be safely used for pasture, woodland, or wildlife habitat. Small areas included in mapping are eroded. (Capability unit VIe-2; woodland suitability group 3; urban group 7)

Paxton stony fine sandy loam, 3 to 8 percent slopes (PdB).—This soil is mostly wooded, though in places it has been cleared and is mainly in pasture or is idle. Using farm machinery is somewhat difficult because of stones. In addition to trees, the soil is suited to hay crops, pasture, orchards, and small grains. Unimproved pasture consisting of native grasses and legumes can be bettered through brush control, liming, and fertilizing. (Capability unit IVes-2; woodland suitability group 2; urban group 5)

Paxton stony fine sandy loam, 8 to 15 percent slopes (PdC).—Controlling runoff is more difficult on this soil than it is on less sloping Paxton soils. Although some areas have been cleared and are pastured or idle, this soil is mainly in forest. Because it is stony, it is of limited use for cultivated crops, but it can be worked for hay, improved pasture, and orchards, all of which are suitable uses. Woodland and wildlife habitat are other good uses. (Capability unit IVes-2; woodland suitability group 2; urban group 6)

Paxton stony fine sandy loam, 15 to 25 percent slopes (PdD).—This soil is largely in forest. Some areas have been cleared and are mainly pastured or idle. Although stones and slopes restrict the operation of modern farm machinery, the soil can be used for pasture, trees, and wildlife habitat. (Capability unit VIes-2; woodland suitability group 3; urban group 7)

Paxton very stony fine sandy loam, 0 to 3 percent slopes (PeA).—This soil generally is forested, but in some places it has been cleared and is used for unimproved pasture or is idle. The soil is so stony that it is not suitable for cultivation, though it is suitable for improved pasture in some areas. Controlling brush and, where feasible, liming and fertilizing help to increase the growth of forage plants. (Capability unit Vs-1; woodland suitability group 7; urban group 6)

Paxton very stony fine sandy loam, 3 to 15 percent slopes (PeC).—This soil occupies drumloidal hills, and most of it is wooded. Some areas have been cleared and are used for unimproved pasture or are idle. Although the soil can be worked for improved pasture in some places, it is more suitable as woodland, unimproved pasture, and habitat for wildlife. Included in mapping are small areas of very stony Woodbridge soils. (Capability unit VIs-2; woodland suitability group 7; urban group 6)

Paxton very stony fine sandy loam, 15 to 35 percent slopes (PeD).—This soil is mostly wooded. Small areas have been cleared and are used for unimproved pasture or are idle. Because the soil is steep and very stony, its use should be limited mainly to woodland and wildlife habitat. Included in areas mapped as this soil are small areas of reddish-brown soils. (Capability unit VIIs-2; woodland suitability group 8; urban group 7)

Peat and Muck

Peat and Muck (Pk) consist of organic materials deposited in bogs and swamps, where the water table is at or near the surface most of the year. These materials are the decomposed and partly decomposed remains of plants, chiefly mosses, sedges, cattails, and the roots, leaves, and stems of woody vegetation, all laid down in permanent bodies of water. The deposits range from about 3 feet to more than 25 feet in depth. They are underlain by mineral soil material that varies in texture. The reaction ranges from extremely acid in the surface layer to medium acid or slightly acid in the lower layers.

Peat and Muck occupy small to fairly large areas that are widely distributed in the county. The common trees, shrubs, and ferns include red maple, elm, ash, alder, white-cedar, black spruce, sweet pepperbush, blueberry, viburnum, cinnamonfern, and royalfern. In scattered areas the principal plants are sedges, cattails, and water-tolerant shrubs.

Most of the acreage is in cutover forest. Small areas have been cleared and partly drained, and these are used for hay and pasture or are idle. On a few acres, an attempt has been made to work the material for commercial uses. (Capability unit VIIw-1; woodland suitability group 11; urban group 12)

The following typical profiles describe the kinds of organic soils that were mapped as Peat and Muck in Litchfield County.

A profile of peat, located in Black Spruce Bog, Mohawk Forest, Cornwall:

1—0 to 6 inches, dark reddish-brown (5YR 3/2) sphagnum peat; extremely acid.
2—6 to 48 inches, dark reddish-brown (5YR 3/3-3/4) fibrous peat; structureless (massive); very strongly acid.
3—48 to 96 inches, dark reddish-brown (5YR 3/2) fibrous peat; structureless (massive); very strongly acid.

4—96 to 192 inches, very dark brown (10YR 2/2) disintegrated peat and fibrous peat, in a proportion of about three to one; structureless (massive); medium acid.
5—192 to 288 inches, very dark brown (10YR 2/2) disintegrated peat and streaks of fibrous peat; medium acid.
6—288 to 312 inches, very dark brown (10YR 2/2) sedimentary peat; slightly acid.
IIC—312 to 324 inches, dark greenish-gray (5GY 4/1) silt loam; slightly sticky and plastic when wet; slightly acid.

A profile of muck over peat, located about 3 miles northwest at Bakersville in the town of New Hartford:

1—0 to 24 inches, black (10YR 2/1) muck and a small amount of woody material; weak, coarse, granular structure; very strongly acid.
2—24 to 36 inches, very dark brown (10YR 2/2) muck; very weak, coarse, granular structure; very strongly acid.
3—36 to 48 inches, dark reddish-brown (5YR 3/3) fibrous peat; structureless (massive); very strongly acid.
4—48 to 96 inches, very dark brown (10YR 2/2) fibrous peat; structureless (massive); very strongly acid.
5—96 to 120 inches, black (10YR 2/1) woody peat; structureless (massive); strongly acid.
6—120 to 204 inches, very dark grayish-brown (10YR 3/2) disintegrated peat; structureless (massive); strongly acid to medium acid.
IIC—204 to 218 inches, dark greenish-gray (5GY 4/1) silt loam; slightly sticky and plastic when wet; medium acid.

Podunk Series

The Podunk series consists of moderately well drained soils that lie on flood plains along the major streams and their tributaries. These soils formed in sediments derived from granite, gneiss, schist, and other rocks. Their permeability is moderate or moderately rapid.

A typical profile in a cultivated field has a surface layer of very friable, very dark grayish-brown fine sandy loam about 8 inches thick. This layer is underlain by very friable, dark-brown to very dark grayish-brown fine sandy loam that is mottled with gray and dark yellowish brown below a depth of about 16 inches. Beginning at a depth of 32 inches, the material is mostly sand and gravel but includes lenses of loamy very fine sand.

Typical profile of Podunk fine sandy loam in a hayfield one-fourth mile northwest of Hotchkissville in the town of Woodbury:

Ap—0 to 8 inches, very dark grayish-brown (10YR 3/2) fine sandy loam; weak, fine, granular structure; very friable; numerous fine roots; strongly acid; clear, wavy boundary.
C1—8 to 16 inches, dark-brown (10YR 3/3) fine sandy loam; structureless (massive); very friable; common fine roots; strongly acid; gradual, wavy boundary.
C2—16 to 24 inches, very dark grayish-brown (10YR 3/2) fine sandy loam that is finely mottled with gray (5Y 5/1) and dark yellowish brown (10YR 3/4); structureless (massive); very friable; strongly acid; gradual, wavy boundary.
C3—24 to 32 inches, dark-gray (10YR 4/1) sandy loam that is mottled with dark yellowish brown (10YR 4/4) and gray (10YR 5/1); coarse fragments 10 percent; very friable; strongly acid; clear, wavy boundary.
C4—32 to 40 inches, very dark grayish-brown (10YR 3/2) and dark yellowish-brown (10YR 4/4) sand and gravel; lenses of loamy very fine sand; loose;

In many places the surface is covered with a layer of soil material recently deposited by floodwater. Generally, the C horizon is fine sandy loam or sandy loam to a depth of 30 inches or more. At depths below 30 inches, the texture is variable but generally grades to loamy sand, sand, or sand and gravel. The depth to these coarse deposits generally is greater in areas along the larger streams than it is along the smaller ones. The profile is very strongly acid or strongly acid.

The hue of the A horizon is chiefly 10YR. Value in this horizon is 2 to 4, and chroma is 1 to 4. The underlying horizons have a hue ranging from 10YR to 5Y. Mottling generally accurs at a depth of 12 to 20 inches.

Podunk soils are near the Ondawa and Rumney soils. Podunk soils are coarser textured and more acid than the moderately well drained Eel soils.

Podunk fine sandy loam (0 to 3 percent slopes) (Po).—In this soil the available moisture capacity is moderate. A seasonal high water table interferes with internal drainage. Flooding is a hazard at times, but it usually is of short duration and seldom damages crops. In the central and western parts of the county, areas mapped as this soil include small areas where some horizons in the profile are medium acid.

Much of the acreage is forested, but some of it has been cleared and is used for hay or pasture or is idle. The soil is well suited to grasses and legumes for hay and pasture, and it is fairly well suited to silage corn, millet, and sudangrass. Alfalfa is subject to frost heave and should not be seeded alone. (Capability unit IIw-5; woodland suitability group 1; urban group 13)

Raynham Series

Soils of the Raynham series are poorly drained and friable. They developed in deep silt and very fine sand that were derived mainly from granite, gneiss, and schist. These soils occur in small to medium-sized areas on terraces along the Housatonic and Still Rivers and in other parts of the county.

A typical profile in a cultivated field has a black silt loam surface layer about 8 inches thick. The subsoil is olive-gray silt loam that contains thin lenses of fine sand and is distinctly mottled with yellowish brown and grayish brown. It extends to a depth of 22 inches. The substratum is olive-gray silt loam that is mottled with various shades of brown.

Typical profile of Raynham silt loam in a hayfield 0.5 mile south of Lanesville on U.S. Route 7 in the town of New Milford:

Ap—0 to 8 inches, black (10YR 2/1) silt loam; weak, medium and fine, granular structure; friable; numerous fine roots; medium acid; clear, smooth boundary.
B2—8 to 22 inches, olive-gray (5Y 5/2) silt loam and thin lenses of fine sand; many, medium, distinct mottles of yellowish brown (10YR 5/6) and grayish brown (2.5Y 5/2); very weak, medium, subangular blocky structure; friable; few fine roots in the upper part of the horizon; slightly acid; gradual, wavy boundary.
C1—22 to 36 inches, olive-gray (5Y 4/2) silt loam and lenses of very fine sand; common, medium, distinct mottles of yellowish brown (10YR 5/6) and grayish brown (2.5Y 5/2); structureless (massive), but breaking into clods; friable; slightly acid; gradual, wavy boundary.
C2—36 to 52 inches, olive-gray (5Y 4/2) silt loam; lenses of silty clay loam below a depth of 44 inches; common, distinct mottles of dark yellowish brown (10YR 4/4); slightly acid.

In the B and C horizons, silt loam or very fine sandy loam is the dominant texture but lenses of finer or coarser textured material are common. The profile generally is free of coarse fragments, though in places there are thin lenses of gravel in the lower solum and the substratum. The thickness of the solum ranges from 20 to 30 inches.

The A1, or Ap, horizon normally is black (10YR 2/1) to very dark gray (10YR 3/1). The matrix of the B horizon has a hue ranging from 10YR to 5Y, a value of 4 to 6, and a chroma of 0 to 2. Generally, mottles occur throughout the B horizon. Hue of the mottles ranges from 7.5YR to 5Y.

The Raynham soils occur closely with, and are in the same drainage sequence as, the well drained Hartland soils, the moderately well drained Belgrade soils, and the very poorly drained Birdsall soils. Raynham soils also are near the poorly drained Walpole soils, but they have a finer textured solum than those soils and in contrast to them, are not underlain by sand and gravel. Compared with the Raynham soils, the poorly drained Fredon soils developed in medium-textured, less acid materials over coarser textured, slightly acid to calcareous materials at a depth of 24 to 30 inches.

Raynham silt loam (Rc).—This inextensive soil has slow runoff and high available moisture capacity. Internal drainage is restricted by a high water table in winter and spring.

Most of this soil is in cutover forest, but some of it has been cleared and is used for pasture and hay. Undrained areas are suitable for pasture, woodland, and wildlife. If drained, the soil can be used for hay, improved pasture, silage corn, and other crops. (Capability unit IIIw-1; woodland suitability group 4; urban group 11)

Ridgebury Series

The Ridgebury series consists of somewhat poorly drained or poorly drained, nearly level or very gently sloping soils that formed on compact glacial till derived chiefly from schist and gneiss but also from granite and quartzite. The till is very firm when moist and is very hard and brittle when dry. These soils are widely distributed in all parts of the county except the northwestern corner. Their permeability is moderate in the surface layer and subsoil but is slow or very slow in the substratum.

A typical profile in an abandoned pasture has a surface layer of very dark brown fine sandy loam about 6 inches thick. The subsoil is grayish-brown fine sandy loam that contains some gravel and is mottled with various shades of brown and olive. This layer extends to a depth of 20 inches. The substratum is a hard, compact layer that is light olive gray mottled with dark yellowish brown and olive gray. The substratum is mainly fine sandy loam, but about 10 percent of the material is gravel.

Typical profile of Ridgebury stony fine sandy loam in an abandoned pasture one-fourth mile north of the intersection of Town Farm Road and John Brown Road in the town of Torrington:

Ap—0 to 6 inches, very dark brown (10YR 2/2) fine sandy loam; some yellowish-brown stains in old root channels; weak, coarse, granular structure; friable but somewhat compacted by cattle; fine roots numerous; coarse fragments about 6 percent; strongly acid; clear, wavy boundary.

B2—6 to 20 inches, grayish-brown (2.5Y 5/2) fine sandy loam; many, medium, distinct mottles of dark brown (7.5YR 4/4), light olive gray (5Y 6/2), and dark yellowish brown (10YR 4/4); structureless (massive), but breaking into weak, subangular clods; friable; few fine roots; coarse fragments about 10 percent; strongly acid; gradual, wavy boundary.

C1xg—20 to 26 inches, light olive-gray (5Y 6/2) fine sandy loam; many, coarse to medium, prominent mottles of brown (7.5YR 4/4), strong brown (7.5YR 5/6), and gray (5Y 5/1); weak, thick, platy structure; very firm; no roots observed; coarse fragments about 10 percent; strongly acid; gradual, wavy boundary.

C2xg—26 to 42 inches, grayish-brown (2.5Y 5/2) to olive-gray (5Y 4/2) fine sandy loam; common, medium, prominent mottles of dark yellowish brown (10YR 4/4) and light olive gray (5Y 6/2); weak, thick, platy structure; very firm; coarse fragments about 15 percent; strongly acid.

Fine sandy loam is the dominant texture in the solum, but in places this grades to sandy loam in the lower part. The C horizon is fine sandy loam or sandy loam, and in some places it is gravelly. Coarse fragments make up 5 to 30 percent of the B horizon and generally 15 to 35 percent of the C horizon. In most places the depth to the fragipan ranges from 14 to 24 inches.

The Ap, or A1, horizon is black (10YR 2/1), very dark gray (10YR 3/1), or very dark brown (10YR 2/2). In the mottled B and C horizons, hue of the matrix generally is 10YR to 5Y but, in some places, is 2.5Y. Value in these horizons is 4 to 6, and chroma normally is 2 or less. Mottles have a hue ranging from 7.5YR to 5Y.

The Ridgebury soils generally lie downslope from the Paxton and Woodbridge soils. They also occur in intricate patterns with the very poorly drained Whitman soils, and they are near the well-drained Charlton soils and the Hollis soils, which are shallow to bedrock. The fragipan of the Ridgebury soils is missing in the poorly drained Leicester soils.

Ridgebury fine sandy loam (0 to 3 percent slopes) (Rd).—Except that its surface layer is free of stones, the profile of this soil is similar to that described as typical for the series. Above the compact pan the soil is friable and has moderate to high available moisture capacity. In winter and spring, however, the water table is at or near the surface. Runoff is slow.

Cleared areas of this soil are used for hay and pasture or are idle. Some of the acreage is forested. If the soil is partly drained, it can be used for grass hay and some kinds of legumes. Where drainage is adequate, silage corn and other crops can be grown. (Capability unit IIIw-1; woodland suitability group 4; urban group 11)

Ridgebury stony fine sandy loam (0 to 3 percent slopes) (Rg).—This soil has the profile described as typical for the series. Unless drainage is improved, excess water limits use to woodland and unimproved pasture. Surface stones also restrict use. In areas that can be partly drained, the soil is suitable for improved pasture and hay. Liming and fertilizing increase the growth of native legumes and grasses, and these plants furnish fair grazing in summer when the weather is dry. The soil also can be used as habitat for wildlife. (Capability unit Vws-2; woodland suitability group 4; urban group 11)

Riverwash

Riverwash (Re) consists mostly of stones and cobblestones but includes some sand and gravel. These materials have been recently deposited along streams. In some areas frequent flooding has removed the fine material and left a continuous pavement of stones and cobblestones.

This land is subject to flooding and to reworking of the materials. It is bare or covered with brush and has little or no value for farming. (Capability unit VIIIs-1; woodland suitability group 11; urban group 13)

Rock Land

Rock land (Rh) is in areas where exposed bedrock occupies more than 50 percent of the surface. Most of the exposed rock is schist, gneiss, and granite. The land is in small to large areas that are widely distributed in the county. Large areas are on Canaan Mountain and on ridges that border the valley of the Housatonic River. Slopes are gentle to hilly or steep.

Rock land is not suitable for cultivated crops, hay, or pasture, and it has little value as woodland. It can be used for wildlife habitat and for hiking, camping, enjoying the scenery, and other forms of recreation. (Capability unit VIIIs-1; woodland suitability group 11; urban group 10)

Rumney Series

The Rumney series consists of poorly drained soils that developed on flood plains in sediments derived mainly from granite, gneiss, schist, and quartzite. These soils are inextensive and occur only in small, scattered areas. They have moderate or moderately rapid permeability.

A typical profile in a cultivated area has a surface layer of very dark gray fine sandy loam about 8 inches thick. The underlying layers are dominantly fine sandy loam or sandy loam but include coarser textured material. They are chiefly gray and olive gray mottled with yellowish brown and strong brown. Below a depth of about 29 inches, the texture is variable.

Typical profile of Rumney fine sandy loam in a hayfield on the east side of Deer Road, one-half mile south of the intersection of Deer Road and Route 8 in the town of Winchester:

Ap—0 to 8 inches, very dark gray (10YR 3/1) fine sandy loam that is discolored dark brown by decomposed roots; very weak, medium, granular structure; very friable; many fine roots in the upper 2 inches and some fine roots below that depth; strongly acid; clear, wavy boundary.

C1—8 to 20 inches, olive-gray (5Y 5/2) fine sandy loam; common, medium, distinct mottles of brown (7.5YR 4/4) and gray (5Y 6/1); structureless (massive), but breaking to clods; friable; no roots observed; strongly acid; gradual, wavy boundary.

IIC2—20 to 24 inches, grayish-brown (2.5Y 5/2) loamy sand; common mottles of brown (7.5YR 4/4); very friable; strongly acid; gradual, wavy boundary.

IIC3g—24 to 29 inches, gray (5Y 5/1) interbedded silt loam and coarse sand; structureless (massive to single grain); coarse fragments about 5 percent; strongly acid; abrupt, smooth boundary.

IIC4—29 to 34 inches, very dark brown (10YR 2/2) sandy loam and lenses of gray (5Y 5/1) silt loam; strongly acid; clear, wavy boundary.

IIIC5—34 to 44 inches, dark-gray (5Y 4/1) gravel, coarse sand, and some cobblestones.

The texture is mostly fine sandy loam or sandy loam to a depth of 20 to 30 inches. Below this depth the material generally is layered sandy loam, sand, and gravel. Lenses of medium-textured material are common, and so are surface horizons of old buried soils.

The Ap, or A1, horizon has a hue of 10YR, a value of 2 to 3, and a chroma of 1 to 2. In the C horizon the hue ranges from 10YR to 5Y, the value is 4 to 5, and the chroma is 1 to 4.

The Rumney soils are near the well drained Ondawa soils, the moderately well drained Podunk soils, and the very poorly drained Saco soils. They also are near Alluvial land, a miscellaneous land type. The Rumney soils are coarser textured than the poorly drained Limerick soils.

Rumney fine sandy loam (0 to 3 percent slopes) (Ru).—This soil is largely in forest or idle, but some of it is used for pasture and hay. In addition, a few small areas are used for cultivated crops. Draining the soil for cultivated crops is impractical in many places because flooding is rather frequent and suitable outlets are lacking. Even if drainage is improved, seasonal flooding remains a hazard and drains are effective only after the floodwater has receded. Nevertheless, in some areas the soil can be drained by tiling or open ditching and used for pasture, hay, and silage corn. Undrained areas are fairly unsuitable for pasture. (Capability unit IIIw-2; woodland suitability group 4; urban group 13)

Saco Series

The Saco series consists of very poorly drained, loamy soils on flood plains. These soils developed in sediments derived from many kinds of rocks, including limestone in places. Generally, they lie in old oxbows and slight depressions, where flooding is a frequent hazard and the water table is at or near the surface in winter and spring. Permeability is moderate.

In a typical profile the surface layer is very dark gray silt loam about 10 inches thick. The next layer is friable, gray silt loam that extends to a depth of 22 inches. It is underlain by very dark brown to gray or dark-gray silt loam that contains lenses of loamy sand and loamy fine sand.

Typical profile of Saco silt loam in a wooded pasture west of the intersection of Belden Road and Sand Road along the Hollenbeck River, town of Canaan:

A1—0 to 10 inches, very dark gray (10YR 3/1) silt loam; weak, medium to fine, granular structure; friable when moist, slightly plastic when wet; many fine roots; medium acid; clear, wavy boundary.

C1g—10 to 22 inches, gray (5Y 5/1) silt loam; few dark yellowish-brown (10YR 4/4) discolorations, possibly caused by decayed roots; structureless (massive); friable; few fine roots; slightly acid; gradual, smooth boundary.

C2—22 to 32 inches, very dark brown (10YR 2/2) silt loam; dark yellowish-brown and yellowish-brown discolorations, caused by decayed roots; structureless (massive); friable; many decayed roots; slightly acid; gradual, wavy boundary.

C3g—32 to 44 inches, gray (N 5/0) silt loam; lenses of loamy sand and loamy very fine sand; structureless (massive); very friable; no roots observed; neutral; gradual, wavy boundary.

C4g—44 to 56 inches, dark-gray (N 4/0) silt loam and lenses of loamy fine sand; structureless (massive); friable when moist, slightly sticky when wet; neutral.

The texture of the C horizon generally is silt loam or very fine sandy loam. In places the C horizon includes thin lenses of silty clay loam or loamy fine sand. Below a depth of 30 inches, the texture ranges from silt loam to very fine sandy loam. In areas along the Housatonic River and other large streams, the C horizon has a more uniform texture than along the smaller, faster flowing streams.

The A horizon generally has a hue of 10YR, a value of 2 to 3, and a chroma of 1 to 2. Common below the A horizon are old buried soils having a surface horizon that is high in

organic-matter content. The layers making up the C horizon are faint. The C horizon has a hue of 10YR to neutral. The profile ranges from medium acid to neutral.

The Saco soils are in the same drainage sequence as the well drained Genesee soils, the moderately well drained Eel soils, and the poorly drained Limerick soils. In places they occur with the moderately coarse textured Ondawa soils and the Podunk and Rumney soils of the flood plains.

Saco silt loam (0 to 3 percent slopes) (Sb).—This soil has high available moisture capacity, but it is very poorly drained and subject to frequent flooding. Most of the acreage is wooded, in unimproved pasture, or wildlife habitat. Grazing is seasonal and usually at its best in dry periods. Draining the soil is not practical in most places, because suitable outlets are lacking and flooding is a frequent hazard. Included in areas mapped as this soil are small areas in which gravelly or sandy materials occur at a depth of 16 to 18 inches. (Capability unit VIw-1; woodland suitability group 5; urban group 13)

Scarboro Series

In the Scarboro series are very poorly drained, nearly level soils that developed in sandy or sandy and gravelly materials on terraces. The materials were derived from many kinds of crystalline rocks but mainly from granite, gneiss, and schist. These soils occupy wet, low-lying areas of small to medium size that are scattered through valleys of the county. Permeability is moderately rapid or rapid.

In a typical profile the surface layer is black loamy fine sand about 11 inches thick. The underlying layers are gray sand that contains a few lenses of fine gravel. Coarse sand and gravel are common at a depth of 28 inches or more.

Typical profile of Scarboro loamy fine sand in a brushy area 0.2 mile south of Mooreville along the Still River, town of Winchester:

O1—2 inches to 1 inch, fresh litter of leaves, ferns, and swamp grass.

O2—1 inch to 0, decomposed and partly decomposed litter.

A1—0 to 11 inches, black (10YR 2/1) loamy fine sand, high in organic-matter content; weak, medium, granular structure; matted with fine and medium roots in the upper part of the horizon; strongly acid; abrupt, wavy boundary.

C1g—11 to 14 inches, gray (5Y 6/1) medium and fine sand; structureless (single grain); loose; no roots observed; strongly acid; gradual, wavy boundary.

C2g—14 to 28 inches, gray (5Y 5/1) sand and a few lenses of fine gravel; structureless (single grain); loose; no roots observed; strongly acid; gradual, wavy boundary.

C3g—28 to 46 inches, gray (5Y 5/1) sand and a few lenses of coarse sand and gravel; olive-gray (5Y 5/2) mottles; structureless (single grain); loose; strongly acid.

The A1 horizon has a high content of organic matter and feels loamy, though its texture is mainly loamy fine sand. Below the A1 horizon the texture is loamy sand or sand. The gravel content ranges from 0 to 15 percent in the upper part of the profile. Below a depth of about 2 feet, the material is gravel free in some places but ranges to sand and gravel in others.

The A horizon is black (10YR 2/1) to very dark brown (10YR 2/2). The C horizon has a hue ranging from 10YR to 5Y and a chroma of 2 or less.

The Scarboro soils are near the Merrimac, Hinckley, Sudbury, and Walpole soils. In addition, they occur with the excessively drained Windsor soils. The Scarboro soils are coarser textured than the very poorly drained Whitman soils of the uplands and they lack the stony surface layer of those soils. Scarboro soils also are coarser textured than the Birdsall soils.

Scarboro loamy fine sand (0 to 3 percent slopes) (Sf).—This soil is rapidly permeable and has very low available moisture capacity, but its drainage is restricted by a seasonal high water table. Because the underlying material is sandy and gravelly, drainage can be readily improved in places where outlets are available.

This soil is chiefly in forest, but some areas have been cleared and are used for unimproved pasture or are idle. Fair pasture is obtained in areas that are partly drained and are limed and fertilized. Where drainage is adequate, hay and improved pasture can be grown. Undrained, the soil is suitable as woodland, for wildlife habitat, and for unimproved pasture in summer. (Capability unit Vw-1; woodland suitability group 5; urban group 12)

Shapleigh Series

The Shapleigh series consists of somewhat excessively drained soils that developed in a thin mantle of glacial till and the underlying residuum derived from bedrock. These soils are shallow to crystalline rock, principally coarse-grained Nonewaug granite and associated pegmatite material. In places shattered rock is at or near the surface and grades into massive bedrock at a depth of less than 20 inches. Bedrock outcrops are common and occupy as much as 50 percent of the surface in extremely rocky areas. The Shapleigh soils are mainly in the towns of Bethlehem, Woodbury, and Watertown. Permeability of the soils is moderately rapid.

A typical profile in a pastured area has a surface layer of dark-brown sandy loam about 6 inches thick. The subsoil is yellowish-brown to olive-brown loamy sand. This is underlain by a thin layer of coarse sand and angular gravel. The depth to granite bedrock is about 16 inches.

Typical profile of Shapleigh very rocky sandy loam, 3 to 15 percent slopes, in an unimproved pasture off a gravel road, 1 mile south of the intersection of Green Hill Road and Route 61 in the town of Bethlehem:

Ap—0 to 6 inches, dark-brown (10YR 3/3) sandy loam; weak, medium, granular structure; very friable; numerous fine roots; coarse fragments about 10 percent; very strongly acid; clear, wavy boundary.

B21—6 to 10 inches, yellowish-brown (10YR 5/4) loamy sand; structureless (massive); very friable; few fine roots; coarse fragments about 15 percent; strongly acid; gradual, wavy boundary.

B22—10 to 14 inches, olive-brown (2.5Y 4/4) loamy sand; structureless (massive); very friable; few fine roots; coarse fragments 15 percent; strongly acid; gradual, wavy boundary.

IIC—14 to 16 inches, olive (5Y 5/3) gravelly coarse sand; numerous pale-yellow (5Y 7/3), angular feldspar fragments; loose; no roots observed; coarse fragments about 30 percent; very strongly acid.

R—16 inches +, bedrock of Nonewaug granite.

In some places the B horizon is light sandy loam. In places the A and B horizons are gravelly and contain angular and subrounded fragments of shattered feldspar and quartzite. The fragments normally are more common directly above bedrock than they are in the upper part of the solum. The depth to bedrock ranges from 12 to 20 inches, but the average depth is about 16 inches.

The Ap horizon has a hue of 10YR, a value of 3 to 4, and a chroma of 2 to 3. The B horizon has a hue of 7.5YR to 10YR in the upper part and 10YR or 2.5Y in the lower part. Generally, chroma and value in the B horizon are 4 to 5.

The Shapleigh soils commonly are near the Gloucester soils, and they developed in glacial till from the same kind of materials as those soils. Shapleigh soils are shallow to bedrock, however, whereas the Gloucester soils are underlain by sand and gravel at a depth of 20 to 30 inches. The Shapleigh occur with the Hollis soils, which have a medium-textured solum.

Shapleigh very rocky sandy loam, 3 to 15 percent slopes (SkC).—This gently sloping to rolling soil has the profile described as typical for the series. Bedrock crops out in many places, and loose stones and boulders are common on the surface. The available moisture capacity is moderately low.

Most of this soil is in cutover forest, but some areas have been cleared and are used mostly for pasture; some are idle. The soil is so rocky and droughty that its use for farming is limited. It is suitable for pasture, as woodland, and for wildlife habitat. (Capability unit VIs–3; woodland suitability group 9; urban group 10)

Shapleigh very rocky sandy loam, 15 to 35 percent slopes (SkE).—This soil is covered with many loose stones and boulders in some places. Small areas of the soil have been cleared and are used for unimproved pasture, but most of the acreage is in forest, a good use. Other good uses are recreation and wildlife habitat. (Capability unit VIIs–3; woodland suitability group 10; urban group 10)

Shapleigh extremely rocky sandy loam, 3 to 15 percent slopes (SmC).—Areas mapped as this soil have more exposed bedrock and generally more loose stones on the surface than areas of less rocky Shapleigh soils. The soil is inextensive and of little importance to farming in the county. It is mainly in forest, though small areas are used for unimproved pasture. The soil is suited to trees, unimproved pasture, and wildlife habitat. (Capability unit VIIs–3; woodland suitability group 9; urban group 10)

Shapleigh extremely rocky sandy loam, 15 to 35 percent slopes (SmE).—This soil is too rocky and too steep for cultivated crops, and it is chiefly in forest. It is suited to trees, wildlife habitat, and recreation. (Capability unit VIIs–3; woodland suitability group 10; urban group 10)

Stockbridge Series

The Stockbridge series consists of well-drained, nearly level to hilly soils that developed in firm or very firm glacial till. The till was derived chiefly from Salisbury schist and limestone but, to some extent, from dolomite and quartzite. These soils occur mainly in the limestone valley in the northwestern part of the county. They also occupy small areas in the town of Goshen and Cornwall, and in these areas they are on smooth drumlins or drumloidal hills. Permeability is moderate in the surface layer and subsoil but is slow or very slow in the substratum.

A typical profile in a cultivated field has a surface layer of very dark grayish-brown loam about 8 inches thick. The upper part of the subsoil is olive-brown loam, and the lower part is dark grayish-brown loam. This layer extends to a depth of about 26 inches. It is underlain by very dark grayish-brown to olive-colored loam in which dark yellowish-brown limestone ghosts are common.

Typical profile of Stockbridge loam, 3 to 8 percent slopes, in a hayfield 1,000 feet north of the intersection of Route 41 and Long Pond Road in the town of Salisbury:

Ap—0 to 8 inches, very dark grayish-brown (10YR 3/2) loam; very weak, medium, subangular blocky structure that is readily crushed to weak, granular structure; friable; numerous fine roots; coarse fragments about 10 percent; slightly acid; clear, smooth boundary.

B21—8 to 17 inches, olive-brown (2.5Y 4/4) loam; weak, medium, subangular blocky structure; friable; few fine roots; coarse fragments about 10 percent; slightly acid; gradual, wavy boundary.

B22—17 to 26 inches, dark grayish-brown (2.5Y 4/2) loam; very weak, thick, platy structure; friable; few fine roots; coarse fragments about 12 percent; slightly acid; gradual, wavy boundary.

C1—26 to 40 inches, very dark grayish-brown (2.5Y 3/2) loam; numerous, dark yellowish-brown (10YR 4/4) limestone ghosts; weak, thick, platy structure; firm to very firm; no roots observed; coarse fragments about 15 percent; neutral; gradual, wavy boundary.

C2—40 to 50 inches, olive (5Y 4/3) loam; many, pale-yellow (2.5Y 7/4), disintegrated and leached limestone fragments; weak, thick, platy structure; firm to very firm; no roots observed; coarse fragments about 15 percent; calcareous.

The C horizon generally is gravelly loam, but it contains some coarse sandy loam in places where crystalline limestone has disintegrated and the cementing materials have been leached away. The clay content generally is less than 18 percent. Coarse fragments in the profile are mainly Salisbury schist and some quartzite.

The Ap, or A1, horizon is dark brown (10YR 3/3) or very dark grayish brown (10YR 3/2). In the upper part of the B horizon, the hue is 10YR or 2.5Y and the value and chroma are 4. The lower part of the B horizon generally has a hue of 2.5Y, a value of 4, and a chroma of 2 to 4. The C horizon is 2.5Y to 5Y in hue, 3 to 4 in value, and 2 to 4 in chroma. In some places the lower B horizon has weak subangular blocky structure to weak platy structure. Where fragments of limestone are numerous, the soil material generally is massive (structureless). Normally, the solum ranges from strongly acid to slightly acid. In most places the depth to carbonates is more than 40 inches.

The Stockbridge soils are in the same drainage sequence as the moderately well drained Amenia soils, the poorly drained Kendaia soils, and the very poorly drained Lyons soils. In the towns of Sharon and Salisbury, the Stockbridge soils occur closely with the Farmington soils, which are shallow to limestone bedrock. The Stockbridge soils are finer textured than the Charlton soils, which developed in friable to firm, acid glacial till. Stockbridge soils also are finer textured than the Dover soils, as well as the acid Paxton soils of drumloidal hills, and they lack the compact layer that occurs in Paxton soils at a depth of about 24 inches. The Stockbridge soils are similar to the Bernardston soils in texture, but those soils contain a hard layer and are acid throughout.

Stockbridge loam, 0 to 3 percent slopes (SnA).—This soil is inextensive and occupies only small scattered areas. Surface runoff is slow. Much of the acreage has been cleared and is used for crops in support of dairying. The soil responds well to fertilization and is well suited to silage corn, small grains, alfalfa, other legumes, grasses, and pasture. Simple conservation measures are needed to maintain good tilth and to supply regular additions of organic matter. (Capability unit I–2; woodland suitability group 2; urban group 5)

Stockbridge loam, 3 to 8 percent slopes (SnB).—A profile of this soil is described as typical for the series. The soil has high available moisture capacity and responds well to fertilization.

This soil is one of the best in the county for dairy farming. Some of it is in cutover forest, but a larger acreage has been cleared and is used for pasture and crops in support of dairying. The soil is well suited to silage corn, sweet corn, small grains, alfalfa, grass for hay, grass-legume mixtures, and pasture. Under good management, cultivation can be intensive. (Capability unit IIe-2; woodland suitability group 2; urban group 5)

Stockbridge loam, 3 to 8 percent slopes, eroded (SnB2).—This soil has a profile somewhat similar to that described as typical for the series, but it is thinner in the surface layer and subsoil. Erosion has removed some of the original surface layer, including organic matter, and the depth to the underlying material is only about 18 inches.

Use and suitability of this soil are similar to those of Stockbridge loam, 3 to 8 percent slopes, but unprotected areas erode more readily and need more carefully applied measures that control runoff, conserve moisture, provide organic matter, and maintain good tilth. (Capability unit IIe-2; woodland suitability group 2; urban group 5)

Stockbridge loam, 8 to 15 percent slopes (SnC).—A small acreage of this soil is in cutover forest, but most of it has been cleared and is used for pasture, hay, and silage corn in support of dairying. Some areas are idle. Although the soil is more susceptible to erosion than less sloping Stockbridge soils, it is well suited to grass hay, alfalfa, various mixtures of grasses and legumes, silage corn, small grains, and pasture. If cultivated crops are grown, suitable practices are needed for reducing runoff and controlling erosion. (Capability unit IIIe-2; woodland suitability group 2; urban group 6)

Stockbridge loam, 8 to 15 percent slopes, eroded (SnC2).—This soil has lost some of its original surface layer through erosion, and the combined thickness of the present surface layer and the subsoil is only about 18 inches. A large percentage of the acreage has been cleared. Most cleared areas are used for pasture, hay, and silage corn, but some of them are idle. Where the soil is wooded, the trees are in cutover stands or have reseeded naturally in fields that were formerly farmed and later abandoned. Among the crops suited to this soil are grass hay, alfalfa, grass-legume mixtures, silage corn, small grains, and pasture. Good management is necessary to reduce runoff, control erosion, furnish organic matter, foster good tilth, and conserve moisture. (Capability unit IIIe-2; woodland suitability group 2; urban group 6)

Stockbridge loam, 15 to 25 percent slopes, eroded (SnD2).—This soil has lost organic matter and some of its original surface layer through erosion. Cleared areas are mainly in pasture or hay, though small narrow strips of this soil are cultivated with larger areas of less sloping soils. Because erosion is a severe hazard, tilled crops should not be grown unless they are part of a long rotation and unless erosion control practices are intensive. Suitable uses for this soil include grasses and legumes for hay or pasture, woodland, and wildlife habitat. Included in mapping are small areas where slopes are 25 to 35 percent. (Capability unit IVe-2; woodland suitability group 3; urban group 7)

Stockbridge stony loam, 3 to 8 percent slopes (SpB).—Except for its stony surface layer, the profile of this soil is similar to the one described as typical for the series. Part of the acreage has been cleared, and part is wooded. Cleared areas are used mainly for pasture, though some of them are idle. The soil is suitable for improved pasture, hay, small grains, and orchards, but stones interfere with the use of modern farm machinery. Included in mapping are small areas having slopes of 0 to 3 percent. (Capability unit IVes-2; woodland suitability group 2; urban group 5)

Stockbridge stony loam, 8 to 15 percent slopes (SpC).—Some of this soil has been cleared and is used mainly for pasture, but most of it is in cutover forest. Some cleared areas are idle. Erosion is a greater hazard on this soil than on less sloping Stockbridge soils. Stones interfere with the use of modern farm machinery. Unimproved pasture is a suitable use, and some areas can be worked for hay, improved pasture, and orchards. (Capability unit IVes-2; woodland suitability group 2; urban group 6)

Stockbridge stony loam, 15 to 25 percent slopes (SpD).—This soil is too steep and too stony for cultivated crops. It is mostly wooded, but some areas have been cleared and are mainly in unimproved pasture or are idle. Some of the acreage is used for improved pasture. Woodland, pasture, and wildlife habitat are good uses for this soil. (Capability unit VIes-2; woodland suitability group 3; urban group 7)

Stockbridge very stony loam, 3 to 15 percent slopes (SrC).—Stones limit the use of this soil for crops and grazing, and most of the acreage is in cutover forest. Cleared areas are in unimproved pasture or are idle. Although improved pasture can be established in some places, more suitable uses are unimproved pasture, woodland, and wildlife habitat. Included in mapping are small areas of Amenia stony silt loam. (Capability unit VIs-2; woodland suitability group 7; urban group 6)

Stockbridge very stony loam, 15 to 35 percent slopes (SrD).—This strongly sloping to hilly soil is chiefly in cutover forest. Cleared areas are used for unimproved pasture or are idle. Woodland and wildlife habitat are suitable uses. Included in areas mapped as this soil are small areas of Amenia and Farmington soils. (Capability unit VIIs-2; woodland suitability group 8; urban group 7)

Sudbury Series

In the Sudbury series are moderately well drained, nearly level and gently sloping soils that developed in sand and gravel derived mainly from granite, gneiss, and schist. The permeability of these soils is moderately rapid in the surface layer and subsoil and is very rapid in the substratum.

A typical profile has a surface layer of very dark grayish-brown fine sandy loam about 8 inches thick. The upper part of the subsoil is yellowish-brown fine sandy loam, and the lower part is light olive-brown loamy sand mottled with dark yellowish brown and grayish brown.

The subsoil extends to a depth of about 24 inches. It is underlain by stratified sand and gravel.

The Sudbury soils were not mapped separately in Litchfield County. They were mapped only in undifferentiated units with the Tisbury soil. These units are described under the heading "Tisbury Series."

Typical profile of a Sudbury soil that has a fine sandy loam surface layer and occurs on a slope of 2 percent, in a hayfield one-half mile south of the intersection of Pete Road and Route 132, on the south side of the road, in the town of Woodbury:

Ap—0 to 8 inches, very dark grayish-brown (10YR 3/2) fine sandy loam; weak, medium, granular structure; friable; numerous fine roots; coarse fragments about 5 percent; abrupt, smooth boundary.

B21—8 to 14 inches, yellowish-brown (10YR 5/4) fine sandy loam; structureless (massive), crushing to soft subangular clods; very friable; numerous fine roots; worm holes commonly filled with material from Ap horizon; coarse fragments about 5 percent; medium acid; gradual, wavy boundary.

B22—14 to 24 inches, light olive-brown (2.5Y 5/4) loamy sand; common, medium, distinct mottles of dark yellowish brown (10YR 4/4) and grayish brown (2.5Y 5/2); structureless (massive); very friable; no roots observed; coarse fragments about 5 percent; medium acid; gradual, wavy boundary.

IIC1—24 to 34 inches, yellowish-brown (10YR 5/4) and brown (10YR 5/3) gravel and sand, and lenses of very fine sand; many, coarse, distinct mottles of yellowish red (5YR 4/6) and light brownish gray (2.5Y 6/2); structureless (single grain); loose; coarse fragments about 25 percent; medium acid; gradual, wavy boundary.

IIC2—34 to 46 inches, yellowish-brown (10YR 5/4), dark grayish-brown (10YR 4/2), and dark grayish brown (2.5Y 4/2) gravel and coarse sand; loose; coarse fragments about 30 percent; medium acid.

Texture in the upper part of the B horizon generally is fine sandy loam but in places is sandy loam; in the lower part it is sandy loam or loamy sand. Coarse fragments ordinarily make up less than 20 percent of the solum. The content of coarse fragments, however, ranges from 5 to 25 percent. The solum generally is about 24 inches thick, but it ranges from 18 to 30 inches in thickness. In most places mottles occur at a depth of 12 to 20 inches.

The Ap, or A1, horizon has a hue of 10YR, a value of 3 to 4, and a chroma of 2 to 3. The B21 horizon is yellowish brown or dark yellowish brown; its hue is 10YR, value is 4 to 5, and chroma is 4 to 8. The mottled B22 horizon ranges from 10YR to 2.5Y in hue, is 4 to 5 in value, and is 4 to 8 in chroma. Mottles have a hue ranging from 7.5YR to 2.5Y.

The Sudbury soils are in the same drainage sequence as the somewhat excessively drained Merrimac soils and the poorly drained Walpole soils. Sudbury soils have textures from fine sandy loam to sandy loam or loamy sand, whereas the Tisbury soils generally are silt loam throughout.

Suncook Series

The Suncook series is made up of excessively drained soils that lie on flood plains along the Naugatuck, Housatonic, Blackberry, and other rivers in the county. These soils occur in long, narrow strips and in fairly small areas, where fresh material is frequently deposited during periods of flooding. The material is derived chiefly from granite, gneiss, schist, and quartzite. Permeability of the Suncook soils is moderate or moderately rapid.

A typical profile has a surface layer of very dark grayish-brown loamy fine sand about 7 inches thick. Next is a subsurface layer of very dark brown loamy fine sand about 2 inches thick. The underlying material, to a depth of 48 inches, consists of dark-brown to grayish-brown loamy sand and sand.

Typical profile of Suncook loamy fine sand in an idle brushy area one-half mile east of the intersection of U.S. Route 44 and Pleasant Valley Road in the town of New Hartford:

A11—0 to 7 inches, very dark grayish-brown (10YR 3/2) loamy fine sand, light brownish gray (10YR 6/2) when dry; structureless; loose; numerous fine roots in the upper 2 inches; very strongly acid; abrupt, smooth boundary. (This layer deposited in the 1955 flood.)

A12—7 to 9 inches, very dark brown (10YR 2/2) loamy fine sand; structureless; loose; few fine roots; very strongly acid; clear, wavy boundary.

C1—9 to 14 inches, dark-brown (10YR 3/3) loamy sand; lenses of very dark grayish-brown (10YR 3/2) sand; structureless (single grain); loose; no roots observed; very strongly acid; gradual, wavy boundary.

C2—14 to 24 inches, dark-brown (10YR 4/3) loamy sand; lenses of very dark grayish-brown (10YR 3/2) sand; structureless (single grain); loose; no roots observed; very strongly acid; gradual, wavy boundary.

C3—24 to 34 inches, grayish-brown (2.5Y 5/2) sand; structureless (single grain); loose; strongly acid; gradual, wavy boundary.

C4—34 to 48 inches, brown (10YR 5/3) sand; lenses of grayish-brown (10YR 5/2) fine sand; structureless (single grain); loose; strongly acid; abrupt, wavy boundary.

In some areas the surface has been covered with a layer of material recently laid down by floodwater, and in these areas the original surface layer is buried or has been washed away entirely. In some places the underlying material includes layers of sand and gravel, and in places there are thin lenses of fine sandy loam or very fine sandy loam. Sand and gravel generally occur at a depth of 40 to 50 inches, but the depth to these materials may be less.

The Suncook soils occur with the Ondawa and Podunk soils. They are coarser textured than those soils.

Suncook loamy fine sand (0 to 3 percent slopes) (St).—This soil has low or very low available moisture capacity and is low in natural fertility. Much of the acreage is idle, though some is in forest or pasture or is used for recreation. The soil has limited suitability for general farm crops. Alfalfa grows well, but plant nutrients are leached rapidly, and adequate amounts of lime and fertilizer should be applied frequently. Also needed is a regular supply of organic matter. Included in areas mapped as this soil are small areas of Riverwash, a miscellaneous land type. (Capability unit IIIs-1; woodland suitability group 6; urban group 13)

Sutton Series

The Sutton series consists of moderately well drained, nearly level to sloping soils that developed in glacial till of Late Wisconsin age. The till was derived mainly from schist but included varying amounts of granite and gneiss. These soils are in areas scattered throughout the county. Their permeability is moderate or moderately rapid.

A typical profile in an undisturbed forested area has a surface layer of very dark grayish-brown fine sandy loam about 3 inches thick. The subsoil is yellowish-brown fine sandy loam in the upper part but grades to light olive-brown sandy loam in the lower part. Mottles of

strong brown, yellowish red, and light brownish gray are common below a depth of 18 inches. The substratum begins at a depth of about 27 inches; it is gray and grayish-brown sandy loam and gravelly sandy loam.

Typical profile of Sutton very stony fine sandy loam, 0 to 3 percent slopes, in a forested area 0.3 mile east of Cedar Swamp Road and 1.7 miles north of Bakersville in the town of New Hartford:

O1—2 inches to 1 inch, raw leaf from mixed hardwoods.
O2—1 inch to 0, decomposed and partly decomposed litter.
A1—0 to 3 inches, very dark grayish-brown (10YR 3/2) fine sandy loam; medium granular structure; very friable; numerous fine and medium roots; coarse fragments less than 5 percent; very strongly acid; abrupt, smooth boundary.
B21—3 to 18 inches, yellowish-brown (10YR 5/6) fine sandy loam; the strongest color is just below the A1 horizon; structureless (massive), breaking to soft subangular clods; very friable; fine roots common; coarse fragments about 8 percent; strongly acid; gradual, wavy boundary.
B22 18 to 24 inches, yellowish-brown (10YR 5/4) fine sandy loam; common, medium, distinct mottles of light brownish gray (2.5Y 6/2), strong brown (7.5YR 5/6), and yellowish red (5YR 4/6); structureless (massive), breaking to soft subangular clods; friable; few fine and medium roots; coarse fragments about 10 percent; strongly acid; gradual, wavy boundary.
B23—24 to 27 inches, light olive-brown (2.5Y 5/4) sandy loam; many mottles of light brownish gray (2.5Y 6/2); structureless (massive); friable; coarse fragments about 10 percent; strongly acid; clear, wavy boundary.
C1g—27 to 35 inches, gray (5Y 5/1) sandy loam and lenses of fine sandy loam; common strong-brown (7.5YR 5/6) and light olive-gray (5Y 6/2) mottles; structureless (massive); friable; coarse fragments about 10 percent; medium acid; clear, wavy boundary.
C2—35 to 42 inches, grayish-brown (2.5Y 5/2) gravelly sandy loam; few dark-brown (7.5YR 4/4) and gray (5Y 6/1) mottles; structureless (massive); friable; coarse fragments about 25 percent; medium acid.

In cultivated areas the Ap horizon is about 8 inches thick. Texture in the solum normally is fine sandy loam. In places, however, it grades to sandy loam in the lower part of the B horizon. The C horizon generally ranges from gravelly fine sandy loam to loamy sand, but coarse-textured material is interbedded with fine sandy loam or sandy loam in places. The consistence of the C horizon ranges from very friable to firm. In most places the solum is 22 to 30 inches thick. Distinct mottles generally occur at a depth of 14 to 20 inches.

The Ap horizon is very dark grayish brown (10YR 3/2) or dark brown (10YR 3/3). The upper part of the B horizon generally has a hue of 10YR, chroma of 4 to 8, and value of 4 to 6. In the lower part of this horizon, the matrix normally is 10YR or 2.5Y in hue, and in the C horizon the matrix has a hue of 2.5Y and 5Y.

The Sutton soils are near the somewhat excessively drained Gloucester soils, the well drained Charlton soils, the poorly drained Leicester soils, and the very poorly drained Whitman soils. Sutton soils are similar to the moderately well drained Woodbridge soils in the solum, but they do not have a fragipan at a depth of about 24 inches. They are coarser textured and more acid than the Amenia soils, which developed in glacial till containing limestone.

Sutton fine sandy loam, 0 to 3 percent slopes (SvA).—The profile of this soil is somewhat similar to that described as typical for the series, but it lacks a very stony surface layer. Although permeability is moderate to rapid, a seasonal high water table keeps the soil from drying out as early in spring as the well-drained Charlton soils. Included in mapping are small areas of soils that are somewhat coarser textured than normal Sutton soils.

Some areas of this soil are forested, and some have been cleared and are used mainly for pasture, hay, and silage corn, all of which are suitable crops. Red clover, birdsfoot trefoil, Ladino clover, and grasses grow well, but alfalfa is subject to frost heaving unless it is grown in drained areas. Adequate drainage also is required for fruit trees and early vegetable crops. Management is needed that maintains good tilth. (Capability unit IIw–1; woodland suitability group 1; urban group 8)

Sutton fine sandy loam, 3 to 8 percent slopes (SvB).—This soil has freer surface drainage than Sutton fine sandy loam, 0 to 3 percent slopes. Included in mapping are small areas where slopes are 8 to 15 percent.

This soil is used principally for hay and pasture in support of dairying. Also, small acreages are used for silage corn, vegetables, and other crops. Grasses and most legumes are suitable, but alfalfa is subject to frost heaving unless drainage is improved. Red clover, birdsfoot trefoil, and Ladino clover grow well. Adequate drainage also is needed for orchards and early vegetable crops. In areas that are clean cultivated, simple measures are adequate for controlling erosion. (Capability unit IIwe–1; woodland suitability group 1; urban group 8)

Sutton stony fine sandy loam, 0 to 3 percent slopes (SwA).—This soil is largely in cutover forest. Some of the acreage has been cleared and is used for hay and pasture or is idle. Included in mapping, mainly in the towns of Torrington and New Hartford, are small areas in which the surface layer and subsoil are coarser textured than those of normal Sutton soils.

Cultivating this stony soil for row crops is difficult, though most areas can be worked for improved pasture, hay, small grains, and small fruits. Improved drainage is needed for orchards, but small fruits generally can be grown in undrained areas, and so can suitable grasses and legumes. (Capability unit IVws–1; woodland suitability group 1; urban group 8)

Sutton stony fine sandy loam, 3 to 8 percent slopes (SwB).—This soil has medium surface runoff and, if left unprotected, is susceptible to erosion. Small areas included in mapping have slopes of 8 to 15 percent.

Row cropping is difficult because of stones, but most areas can be worked for improved pasture, hay, small grains, and small fruits. Drainage must be adequate in fields used for orchards. (Capability unit IVws–1; woodland suitability group 1; urban group 8)

Sutton very stony fine sandy loam, 0 to 3 percent slopes (SxA).—A profile of this soil is described as typical for the Sutton series. The soil occurs throughout the uplands, except in the limestone areas.

Most of this soil is in cutover forest. Scattered areas have been cleared and are used mainly for unimproved pasture or are idle. In some places the soil can be worked for improved pasture, but it is more suitable for trees, unimproved pasture, or wildlife habitat. Liming and fertilizing will increase the growth of native grasses and legumes. (Capability unit Vs–1; woodland suitability group 7; urban group 8)

Sutton very stony fine sandy loam, 3 to 15 percent slopes (SxC).—This soil is suitable for trees, grazing, and

wildlife habitat. In some areas it can be used for improved pasture. Most of the acreage is forested, but some has been cleared and is pastured or idle. Some areas of Leicester very stony fine sandy loam are included in mapping. (Capability unit VIs-1; woodland suitability group 7; urban group 8)

Terrace Escarpments

Terrace escarpments (Tg) consist of gravelly and sandy material that has slopes exceeding 15 percent. These escarpments are in small areas scattered on terrace breaks, in highly dissected areas, and on kames and eskers. The slopes generally are short and range from 100 feet to several hundred feet in width. In most places the surface layer is gravelly sandy loam or gravelly loamy sand. Runoff is rapid, and some areas are eroded.

Soils that make up Terrace escarpments are the Hinckley, Merrimac, Windsor, Groton, and Copake soils.

Most of the acreage is wooded, but some of it has been cleared and is used for pasture or is idle. Because the escarpments are strongly sloping to steep and are highly erodible, their use is limited mainly to woodland, pasture, and wildlife habitat. (Capability unit VIe-3; woodland suitability group 6; urban group 7)

Tisbury Series

The Tisbury series consists of moderately well drained soils that formed in silt and very fine sand underlain by stratified sand and gravel. The medium-textured materials were laid down by wind or water and were derived from granite, gneiss, schist, and quartzite. Permeability is moderate in the surface layer and subsoil but is very rapid in the substratum.

A typical profile in a cultivated area has a surface layer of very dark grayish-brown silt loam about 8 inches thick. The upper part of the subsoil is friable, yellowish-brown silt loam, and the lower part is yellowish-brown or grayish-brown silt loam or very fine sandy loam that contains brownish and grayish mottles. This layer extends to a depth of about 24 inches. It is underlain by sand and gravel.

Typical profile of a Tisbury soil having a silt loam surface layer, in a plantation of red and white pines 2 miles south of Bristol Reservoir No. 4 on Route 72, thence 600 feet west, in the town of Plymouth:

Ap—0 to 8 inches, very dark grayish-brown (10YR 3/2) silt loam; weak, medium, granular structure; very friable; numerous fine roots; coarse fragments less than 2 percent; strongly acid; clear, smooth boundary.

B21—8 to 16 inches, yellowish-brown (10YR 5/6) silt loam; very dark grayish-brown worm casts; structureless (massive), breaking to subangular clods; friable; medium and fine roots common; coarse fragments less than 3 percent; strongly acid; gradual, wavy boundary.

B22—16 to 22 inches, yellowish-brown (10YR 5/4) silt loam or very fine sandy loam; common, medium, distinct mottles of strong brown (7.5YR 5/6) and grayish brown (2.5Y 5/2); structureless (massive), breaking to subangular clods; very friable; few fine roots; coarse fragments less than 5 percent; strongly acid; gradual, wavy boundary.

B23—22 to 24 inches, grayish-brown (10YR 5/2) silt loam or very fine sandy loam; common, medium, distinct mottles of brown (7.4YR 4/4), strong-brown (7.5YR 5/6), and light brownish gray (2.5Y 6/2); no roots observed; coarse fragments less than 2 percent; strongly acid; abrupt, wavy boundary.

IIC—24 to 40 inches, grayish-brown (2.5Y 5/2) and brown (10YR 5/3) sand and gravel; structureless (single grain); coarse fragments 50 to 60 percent; medium acid.

The depth to sand and gravel is generally 24 inches but ranges from 18 to 30 inches. The B horizon is normally silt loam, though it ranges to very fine sandy loam in some areas. In places the solum is silt loam in the upper part and grades to very fine sandy loam just above the IIC horizon. The content of coarse fragments in the solum is 0 to 15 percent.

The Ap horizon is very dark grayish brown (10YR 3/2) to dark brown (10YR 3/3). The B21 horizon ranges from strong brown (7.5YR 5/6) to yellowish brown (10YR 5/6–5/8). In the B22 horizon the matrix is somewhat paler than the B21 horizon but has a hue of 10YR or 2.5Y. Mottles in the B22 horizon range from strong brown (7.5YR 5/6) to grayish brown (2.5Y 5/2) or light brownish gray (2.5Y 6/2).

The Tisbury soils are near the well-drained Enfield soils, but the Enfield consist of medium-textured material over sand and gravel. The moderately well drained Tisbury soils are near soils that are similar to them in drainage. These similar soils are the Sudbury, which have a coarser textured solum than the Tisbury soils; the Deerfield, which developed in deep loamy sand and sand; and the Belgrade, which developed in deep silt and very fine sand. The Tisbury soils occur with the poorly drained or very poorly drained Walpole, Raynham, Scarboro, and Birdsall soils.

Tisbury and Sudbury soils, 0 to 3 percent slopes (TwA).—The soils that make up this undifferentiated unit are in small scattered areas. They occupy a fairly small total acreage, and probably 75 percent of it consists of Tisbury silt loam. A profile of this soil is described as typical for the Tisbury series. Although permeability is moderate or moderately rapid in these soils, a seasonal high water table restricts internal drainage in winter and spring. The soils dry out slowly in spring, but they are easy to work and respond to good management.

Part of the acreage is in forest, and part has been cleared and is used mainly for hay, pasture, and silage corn. Some of the cleared acreage is idle. Forested areas are mainly in mixed hardwoods, though scattered hemlocks and pines also occur. Alfalfa is subject to frost heaving and generally is not suited to these soils, but other legumes and grasses do well. Growth of other farm crops is increased if drainage is improved. Where outlets are available, adequate drainage can be readily provided. Undrained areas are suitable for pasture, hay, silage corn, vegetable crops, and trees. (Capability unit IIw-1; woodland suitability group 1; urban group 8)

Tisbury and Sudbury soils, 3 to 8 percent slopes (TwB).—These soils have medium surface runoff and, unless protected, are subject to water erosion. Some of their acreage is forested, and some is idle or is used mainly for hay, pasture, and silage corn. Grasses and most legumes grow well, but alfalfa is subject to frost heaving. The suitability of the soils for crops can be improved by providing adequate drainage. Undrained areas are suited to pasture, hay, silage corn, vegetable crops, and trees. (Capability unit IIwe-1; woodland suitability group 1; urban group 8)

Walpole Series

The Walpole series consists of poorly drained or somewhat poorly drained, nearly level soils that formed in sandy or sandy and gravelly deposits on terraces. These soils occur in scattered areas throughout the county. The water table is near the surface in winter and early in spring. Permeability is moderately rapid in the surface layer and subsoil and is very rapid in the substratum.

A typical profile has a surface layer of very dark gray fine sandy loam about 6 inches thick. The subsoil, to a depth of about 26 inches, is grayish-brown to olive-gray sandy loam that is strongly mottled with various shades of brown and gray. The substratum is made up of mottled, olive-brown sand and gravel.

Typical profile of a Walpole soil having a fine sandy loam surface layer, in a brushy area one-fourth mile northwest of the intersection of Route 25 and Eisendrath Road, Bakersville, in the town of New Hartford:

O1—2 inches to 1 inch, fresh litter from young hardwoods and brush.
O2—1 inch to 0, decomposed litter of similar origin.
A1—0 to 6 inches, very dark gray (10YR 3/1) fine sandy loam; weak, coarse, granular structure; friable; numerous fine roots; coarse fragments about 5 percent; strongly acid; clear, wavy boundary.
B21g—6 to 18 inches, grayish-brown (2.5Y 5/2) sandy loam; many, medium, distinct mottles of dark brown (7.5YR 4/4), yellowish brown (10YR 5/4), and light brownish gray (2.5Y 6/2); structureless (massive), breaking into irregular clods when disturbed; fine roots common; coarse fragments about 10 percent; strongly acid; gradual, wavy boundary.
B22g—18 to 26 inches, olive-gray (5Y 5/2) sandy loam; many, medium, distinct mottles of brown (7.5YR 4/4), strong brown (7.5YR 5/6), and light olive gray (5Y 6/2); structureless (massive); friable; no roots observed; coarse fragments 15 to 20 percent; strongly acid; gradual, wavy boundary.
IIC—26 to 40 inches, olive-brown (2.5Y 4/4) sand and gravel; brown (7.5YR 4/4), strong-brown (7.5YR 5/6), and gray (5Y 5/1) mottles; structureless (single grain); loose; coarse fragments about 25 percent; strongly acid.

Texture in the solum generally is fine sandy loam or sandy loam, and in places the soil material is stratified. Thickness of the solum ranges from 20 to 30 inches. The IIC horizon is sandy and gravelly, but in some places it includes lenses of finer textured material. The percentage of gravel in the solum ranges from 0 to 20 percent. The profile is very strongly acid or strongly acid.

The A1, or Ap, horizon is black (10YR 2/1) or very dark gray (10YR 3/1). The B horizon has a hue of 10YR, 2.5Y, or 5Y in the matrix; a value of 4 to 6; and a chroma generally of 2 but ranging from 1 to 3. Hue of the mottles ranges from 7.5YR to 5Y.

The Walpole soils are near the Merrimac, Sudbury, and Scarboro soils. Walpole soils and the poorly drained Leicester soils are somewhat similar, but the Leicester formed in glacial till and are conspicuously stony.

Walpole and Raynham soils (0 to 3 percent slopes) (Wl).—This undifferentiated unit consists of Walpole soils and Raynham soils in about equal proportions. The soils are inextensive; they occur in many, small, scattered areas. Their runoff is slow or very slow, and their internal drainage is restricted by a seasonal high water table.

A large part of the acreage is forested or idle. Most cleared areas are used for hay and pasture. If drainage is improved, silage corn and other crops can be grown. (Capability unit IIIw-1; woodland suitability group 4; urban group 11)

Wareham Series, Nonacid Variant

Soils of the Wareham series, nonacid variant, are medium acid to neutral in the surface layer and subsoil and are neutral or mildly alkaline in the substratum. These nearly level, poorly drained soils developed in fluvial materials derived from limestone, quartzite, schist, and other rocks. They occupy only a limited acreage in the county and are not important to farming. They occur mainly in the vicinity of Robbins Swamp in the town of Canaan. Their permeability is moderate.

A typical profile in a cultivated field has a surface layer of very dark gray loamy fine sand about 10 inches thick. This layer overlies a subsoil of grayish-brown to light brownish-gray medium and fine sand that contains many, distinct mottles of yellowish brown, grayish brown, and light olive gray. The subsoil extends to a depth of about 30 inches. It is underlain by gray coarse sand that is mildly alkaline and faintly mottled.

Typical profile of Wareham loamy fine sand, nonacid variant, in a hayfield at the northeast corner of the intersection of Page Road and Sand Road in the town of Canaan:

Ap—0 to 10 inches, very dark gray (10YR 3/1) loamy fine sand, dark gray (10YR 3/1 and 4/1) when dry; weak, medium, granular structure; very friable; fine roots numerous; slightly acid; clear, smooth boundary.
B21—10 to 16 inches, grayish-brown (2.5Y 5/2) medium sand; many, medium, distinct mottles of yellowish brown (10YR 5/4) and grayish brown (2.5Y 5/2); structureless (single grain); loose; few fine roots; neutral; gradual, wavy boundary.
B22—16 to 30 inches, light brownish-gray (2.5Y 6/2) medium and fine sands; many, medium, distinct mottles of yellowish brown (10YR 5/6) and light olive gray (5Y 6/2); structureless (single grain); loose; no roots observed; neutral; gradual, wavy boundary.
Cg—30 to 44 inches, gray (5Y 5/1) coarse sand; few, medium, faint mottles of light olive brown (2.5Y 5/4); structureless (single grain); loose; mildly alkaline.

The Ap, or A1, horizon is dominantly loamy fine sand that has a high organic-matter content. The B horizon is loamy sand or sand, and the C horizon generally is medium or coarse sand. Lenses of gravel occur in places, but the total content of gravel is less than 10 percent, and normally the profile is gravel free. In most places the solum ranges from 24 to 30 inches in thickness. In undisturbed forested areas, the A1 horizon is 4 to 8 inches thick.

The Ap, or A1, horizon is very dark gray (10YR 3/1) or very dark brown (10YR 2/2). In the B horizon the matrix has hues of 2.5Y and 5Y, a value of 5 to 6, and a chroma of 1 to 3. Hue of the mottles is 10YR. The C horizon has a hue of 2.5Y or 5Y, a value of 5 to 6, and a chroma of 2 or less. The profile is medium acid to neutral in the solum and is neutral or mildly alkaline in the substratum.

Soils of the Wareham series, nonacid variant, are near the excessively drained Groton soils, the well-drained Copake soils, and the poorly drained Fredon soils. They occur with the very poorly drained Granby soils, which also developed in deep loamy sand and sand and are neutral or slightly alkaline in the substratum. These Wareham soils are coarser textured than the Walpole soils and, in contrast to those soils, are not acid throughout.

Wareham loamy fine sand, nonacid variant (0 to 3 percent slopes) (Wmx).—This soil has low available moisture capacity and is low in natural fertility. Its internal drainage is restricted by a fluctuating water table that rises to within several inches of the surface in winter and spring.

The acreage of this soil is small and is mostly forested. If outlets are available, drainage can be readily improved. Partly drained areas are suited to water-tolerant grasses and legumes and hay and pasture. Undrained, the soil can be used for pasture, grass hay, trees, and wildlife habitat. (Capability unit IIIw-1; woodland suitability group 4; urban group 11)

Whitman Series

The Whitman series consists of very poorly drained, nearly level soils that occupy uplands and developed in glacial till of Late Wisconsin age. The till was derived mainly from schist, gneiss, and granite. These soils occur in low-lying, small to medium-sized areas, where they receive runoff and, in places, material washed from surrounding soils. The Whitman soils are widely distributed in the county except in the limestone valley. Their permeability is moderate.

A typical profile in an unimproved pasture has a surface layer of black stony fine sandy loam or silt loam about 10 inches thick. Next is a strongly gleyed subsurface layer of gray to light-gray loamy sand. The subsoil, which also is gleyed, consists of gray and greenish-gray fine sandy loam that is distinctly mottled with various shades of brown. It extends to a depth of about 26 inches. The substratum is olive-gray gravelly fine sandy loam that contains mottles, but these are fewer and less distinct with depth. A few lenses of sandy loam occur in the substratum.

Typical profile of Whitman stony fine sandy loam in an improved pasture 0.3 mile south of Morris Center on the west side of Route 61, town of Morris:

Ap—0 to 10 inches, black (10YR 2/1) stony fine sandy loam or silt loam that is high in organic-matter content; dark reddish-brown (5YR 3/4) stains along old root channels; weak, coarse to medium, granular structure; friable; numerous fine roots; coarse fragments about 5 percent; strongly acid; clear, smooth boundary.

A2g—10 to 14 inches, gray (5Y 5/1) to light-gray (5Y 6/1) loamy sand; few, fine, faint mottles of light olive brown (2.5Y 4/4); weak, thick, platy structure; very friable; no roots observed; coarse fragments about 5 percent; medium acid; clear, wavy boundary.

B2g—14 to 26 inches, gray (5Y 5/1) and greenish-gray (5GY 5/1) fine sandy loam; common, medium, distinct mottles of light olive brown (2.5Y 5/4) and dark yellowish brown (10YR 4/4); weak, subangular blocky structure; firm in place, friable when removed; no roots observed; coarse fragments about 15 percent; slightly acid; diffuse, wavy boundary.

Cxg—26 to 40 inches, olive-gray (5Y 4/2–5/2) gravelly fine sandy loam; few, medium, faint mottles of gray (5Y 5/1) and light olive brown (2.5Y 5/4); weak, thick, platy structure; very firm in place but friable when removed; coarse fragments about 25 percent; slightly acid.

Coarse fragments in the profile are gneiss, schist, and quartzite. The A1, or Ap, horizon normally is fine sandy loam or silt loam and contains a large amount of organic matter. The A2g horizon is sandy loam or loamy sand. The B horizon is mainly fine sandy loam. Its content of gravel normally increases with depth. The A1 horizon is about 10 inches thick in most places, but it generally ranges from 8 to 12 inches in thickness.

The A1, or Ap, horizon is black (10YR 2/1) or very dark brown (10YR 2/2). The A2g horizon is strongly gleyed and has a chroma of 0 to 1 or a hue of 5Y or bluer. Below the A horizon the hue is 2.5Y to 5Y and the chroma is 1 to 2 in the matrix. In the A2g horizon, mottles are generally absent or are few and faint.

The Whitman soils are in the same drainage sequence as the well drained Charlton soils, the moderately well drained Sutton soils, and the poorly drained Leicester soils. They also occur with the moderately well drained Woodbridge soils and the somewhat poorly drained or poorly drained Ridgebury soils. Whitman soils are coarser textured than the Lyons soils, which developed in calcareous till, but they are not so coarse textured as the Scarboro soils, for those soils developed in loamy sand and sand containing gravel in places.

Whitman stony fine sandy loam (0 to 3 percent slopes) (Wp).—This soil is mainly wooded, but some areas have been cleared and are used chiefly for pasture or are idle. Pasture is grown in partly drained areas that adjoin better drained soils. Woodland and wildlife habitat are suitable uses for this soil. Included with it in mapping are small areas where most of the stones have been removed. (Capability unit Vws-1; woodland suitability group 5; urban group 12)

Windsor Series

The Windsor series consists of excessively drained, nearly level to sloping soils that developed in deep sand and loamy sand. These soil materials were derived mainly from granite, gneiss, and schist, but they also come from quartzite and other rocks. In some areas the materials were reworked by wind. The Windsor soils occur in the major valleys of the county. They are rapidly permeable.

A typical profile in a cultivated area has a surface layer of dark-brown loamy fine sand about 8 inches thick. The subsoil is dark yellowish-brown or yellowish-brown loamy sand or sand that extends to a depth of about 24 inches. Light olive-brown sand makes up the substratum.

Typical profile of Windsor loamy fine sand, 0 to 3 percent slopes, in an idle area 0.9 mile north of Boardman Bridge, on the east side of the Housatonic River, in the town of New Milford:

Ap—0 to 8 inches, dark-brown (10YR 3/3) loamy fine sand; weak, medium, granular structure; very friable; fine numerous roots; very strongly acid; clear, smooth boundary.

B21—8 to 16 inches, dark yellowish-brown (10YR 4/4) loamy sand; structureless (single grain); loose; few fine roots; strongly acid; clear, wavy boundary.

B22—16 to 24 inches, yellowish-brown (10YR 5/6–5/8) loamy sand or sand; structureless (single grain); loose; very few fine roots; strongly acid; gradual, wavy boundary.

C—24 to 60 inches, light olive-brown (2.5Y 5/4) sand; structureless (single grain); loose; no roots observed; medium acid.

The texture of the B horizon ranges from loamy fine sand to sand. The C horizon is chiefly medium sand, though the range is from coarse sand to fine sand. Lenses of gravel and scattered pebbles occur in some places, but these fragments rarely make up more than 10 percent of the volume. Thickness of the solum normally ranges from 22 to 30 inches.

The Ap horizon generally has a hue of 10YR, a value of 3 to 4, and a chroma of 2 to 3. In the upper part of the B horizon, the hue normally is 10YR but in places is 7.5YR. The lower part of the B horizon and the C horizon have hues of 10YR and 2.5Y.

The Windsor soils commonly occur near the excessively drained Hinckley soils and the somewhat excessively drained Merrimac soils. They lack the gravel that is characteristic of the Hinckley soils, and they are coarser textured than the Merrimac soils.

Windsor loamy fine sand, 0 to 3 percent slopes (WvA).—This soil has the profile described as typical for the series. The soil is low in natural fertility and has very low available moisture capacity. Water erosion is only a slight hazard, but wind damage is likely if the surface is left unprotected. The soil warms up early in spring. Included in mapping are small areas where the subsoil and underlying material are slightly acid or neutral.

This soil is mainly wooded, but in scattered areas it has been cleared and is used for hay and pasture or is idle. Alfalfa grows well if lime and fertilizer are frequently applied in adequate amounts. Unless the soil is irrigated, however, crops such as silage corn are damaged at times when moisture is insufficient in summer. In managing the soil for farm crops, providing adequate water and maintaining fertility are the main concerns. (Capability unit IIIs–1; woodland suitability group 6; urban group 1)

Windsor loamy fine sand, 3 to 8 percent slopes (WvB).—This soil has very low available moisture capacity and is droughty. A large part of the acreage is in forest, though some areas have been cleared and are pastured or idle. Alfalfa does well if adequately limed and fertilized, but silage corn and some other crops must be irrigated if they are to grow satisfactorily. Water erosion is a greater hazard on this soil than it is on Windsor loamy fine sand, 0 to 3 percent slopes. Included in mapping are small areas where the lower subsoil and the underlying material are slightly acid or neutral. (Capability unit IVse–1; woodland suitability group 6; urban group 1)

Windsor loamy fine sand, 8 to 15 percent slopes (WvC).—This inextensive soil is very droughty and, in unprotected areas, is subject to soil blowing and water erosion. Included in mapping are small areas where the lower subsoil and underlying material are slightly acid or neutral.

Nearly all the acreage of this soil is forested or idle. Some cleared areas are pastured. Unless moisture is adequate and fertility is maintained, the soil is poorly suited to general farm crops and pasture. If limed and fertilized, it is fairly well suited to alfalfa. (Capability unit IVse–1; woodland suitability group 6; urban group 2)

Woodbridge Series

The Woodbridge series consists of moderately well drained, nearly level to sloping soils that developed in compact glacial till of Late Wisconsin age. The till was derived mainly from gray mica schist but included varying amounts of granite and gneiss. These soils are underlain by a compact layer, or pan, at a depth of about 24 inches. They occur in all parts of the county except the limestone area in the northwestern part. In many places they lie on drumloidal hills. Their permeability is moderate in the surface layer and subsoil but is slow or very slow in the substratum.

A typical profile in a forested area has a surface layer of friable, very dark grayish-brown very stony fine sandy loam about 3 inches thick. The subsoil is dark yellowish-brown fine sandy loam that contains olive and light brownish-gray mottles in the lower part. This layer extends to a depth of about 22 inches. The substratum is a hard, compact layer consisting of light olive-brown sandy loam that is strongly mottled with light brownish gray, reddish brown, and dark brown. It is very slowly permeable and extremely hard when dry. Below a depth of 28 inches, the mottles are fewer and less distinct and the texture is gravelly fine sandy loam.

Representative profile of Woodbridge very stony fine sandy loam, 3 to 15 percent slopes, in a wooded area one-half mile east of the intersection of Route 8 and U.S. Route 44 in Winsted, town of Winchester:

O1 and O2—1½ inches to 0, raw leaf litter and partly decomposed and decomposed litter from deciduous trees.

A1—0 to 3 inches, very dark grayish brown (10YR 3/2) fine sandy loam; weak, medium to fine, granular structure; very friable; numerous fine and medium roots; coarse fragments about 8 percent; strongly acid; clear, wavy boundary.

B21—3 to 16 inches, dark yellowish-brown (10YR 4/4) fine sandy loam; structureless (massive), breaking into irregular clods; friable; many fine and medium roots; coarse fragments about 8 percent; medium acid; gradual, wavy boundary.

B22—16 to 22 inches, dark yellowish-brown (10YR 4/4) fine sandy loam; common olive (5Y 4/4) and light brownish-gray (2.5Y 6/2) mottles; structureless (massive), breaking into irregular clods; friable; few medium roots; coarse fragments about 14 percent; medium acid; clear, wavy boundary.

C1x—22 to 28 inches, light olive-brown (2.5Y 5/4) sandy loam; light brownish-gray (2.5Y 6/2), reddish-brown (5YR 4/4), and dark-brown (7.5YR 4/4) mottles; weak, medium, platy structure; very firm; no roots observed; coarse fragments about 14 percent; medium acid; clear, wavy boundary.

C2x—28 to 41 inches, grayish-brown (2.5Y 5/2) gravelly fine sandy loam; a few dark yellowish-brown (10YR 4/4) mottles that are mostly in the upper part of the horizon; weak, thick, platy structure; very firm; medium acid.

The texture of the fragipan (C1x and C2x horizons) is mainly fine sandy loam or sandy loam. Coarse fragments make up 5 to 35 percent of the solum. Thickness of the solum is generally 18 to 24 inches but ranges from 16 to 30 inches. In places a thin A'2 horizon is present just above the fragipan, and it is coarser textured than the horizons above and below it.

In cultivated areas the Ap horizon is 10YR in hue; it has a value of 3 to 4 and a chroma of 2 to 3. In the B horizon the hue is generally 10YR in the upper part and is 10YR or 2.5Y in the matrix of the lower part. Depth to mottles ranges from 12 to 20 inches. Mottles normally are few and faint near their upper limit, but they increase to common or many and are distinct in the lower B and the C horizons.

The Woodbridge soils generally lie downslope from the well-drained Paxton soils. They also occur near the well drained Charlton soils, the moderately well drained Sutton soils, the poorly drained Ridgebury soils, and the very poorly drained Whitman soils. The substratum of the Woodbridge soils contains a compact pan layer, whereas that of the Sutton soils is friable to firm but does not contain a pan. Woodbridge soils are similar to the Amenia soils in drainage, but those soils developed in calcareous till from limestone.

Woodbridge fine sandy loam, 0 to 3 percent slopes (WxA).—This soil lacks a very stony surface layer, but otherwise its profile is similar to the one described as typical for the series. Although the available moisture capacity is moderate, internal drainage is restricted by a compact layer.

This soil dries out slowly in spring, and it stays wet for several days after heavy rainfall in summer. Nevertheless, it is suited to hay crops and pasture and is fairly well suited to silage corn and small grains. Alfalfa is subject to frost heaving. Providing adequate drainage improves this soil for some kinds of row crops and for alfalfa. In places terracing helps to divert seepage and runoff from higher areas. (Capability unit IIw–2; woodland suitability group 1; urban group 9)

Woodbridge fine sandy loam, 3 to 8 percent slopes (WxB).—This soil has freer surface drainage than less sloping Woodbridge soils. Included in mapping, in the town of Woodbury, are small areas of soils that have a reddish-brown profile. Also included, in the town of Salisbury, are small areas of soils that developed in dark-colored schistose till and are silt loam throughout.

This soil is suited to hay crops and pasture and is fairly well suited to silage corn and small grains. Unless drainage is improved, alfalfa is subject to frost heaving. In fields where clean-cultivated crops are grown, simple practices are needed for reducing runoff and controlling erosion. In some places it is necessary to use diversion terraces and graded stripcropping. (Capability unit IIwe–2; woodland suitability group 1; urban group 9)

Woodbridge fine sandy loam, 8 to 15 percent slopes (WxC).—This soil commonly occurs in the lower sides of drumlins, downslope from the well-drained Paxton soils. It has freer runoff and is more susceptible to erosion than less sloping Woodbridge soils. Small areas included in mapping are eroded.

Part of this soil has been cleared, and part is in cutover forest. Cleared areas are used mainly for hay and pasture, though some small ones are in silage corn and some are idle. The soil is suited to moisture-tolerant grasses and legumes for hay and pasture, but it is not suited to alfalfa, which is subject to frost heaving. (Capability unit IIIew–2; woodland suitability group 1; urban group 9)

Woodbridge stony fine sandy loam, 0 to 3 percent slopes (WyA).—The profile of this soil has a less stony surface layer than the one described as typical for the series. Most of the acreage is in cutover forest, though some areas have been cleared and are used mainly for pasture or are idle. Because of stones, the soil is not suited to crops that require intensive cultivation, but it can be worked for hay, improved pasture, and small grains. Improved drainage is needed for alfalfa and orchards. Grasses and other legumes, however, can be grown in undrained areas. (Capability unit IVws–2; woodland suitability group 1; urban group 9)

Woodbridge stony fine sandy loam, 3 to 8 percent slopes (WyB).—This soil has better surface drainage than less sloping Woodbridge soils. Although some of the acreage has been cleared and is mainly pastured or idle, most areas are in cutover forest. The soil is so stony that it is not suited to crops requiring intensive cultivation, but it can be worked for hay, improved pasture, and small grains. For alfalfa and orchards, improved drainage is needed. (Capability unit IVws–2; woodland suitability group 1; urban group 9)

Woodbridge stony fine sandy loam, 8 to 15 percent slopes (WyC).—This soil has more rapid runoff than less sloping Woodbridge soils. Trees cover most of the acreage, but scattered areas have been cleared and are used chiefly for unimproved pasture or are idle. Woodland, pasture, and wildlife habitat are suitable uses. Liming and fertilizing will increase the growth of native grasses and legumes. (Capability unit IVws–2; woodland suitability group 1; urban group 9)

Woodbridge very stony fine sandy loam, 0 to 3 percent slopes (WzA).—This soil is mostly wooded, though in some areas it has been cleared and is used for unimproved pasture or is idle. The soil is too stony for cultivated crops but is suitable as woodland, pasture, and habitat for wildlife. (Capability unit Vs–1; woodland suitability group 7; urban group 9)

Woodbridge very stony fine sandy loam, 3 to 15 percent slopes (WzC).—This soil has the profile described as typical for the series. Most of the acreage is wooded. The soil has freer surface runoff than less sloping very stony soils, but it can be used in about the same way. Among the suitable uses are woodland, unimproved pasture, and wildlife habitat. (Capability unit VIs–2; woodland suitability group 7; urban group 9)

Formation and Classification of Soils

In this section the factors that affect the formation of soils in Litchfield County are discussed. Then, the current system of soil classification is explained and the soils are placed in higher categories. The soil series in the county, including a profile representative of each series, are described in the section "Descriptions of the Soils."

Formation of Soils

Soil is produced by the action of soil-forming processes on materials deposited or accumulated by geologic agencies. The characteristics of the soil at any given point are determined by (1) the composition of the parent material; (2) the climate under which the soil material has accumulated and existed since accumulation; (3) the plant and animal life on and in the soil; (4) the relief, or lay of the land; and (5) the length of time the processes of soil development have acted on the soil material.

Climate and plant and animal life, particularly vegetation, are the active forces in soil formation. They act on the parent material and change it into a body having definite soil characteristics. All five factors come into play in the formation of every soil, but the relative importance of each factor varies from place to place. In some places one factor is dominant and fixes most of the properties of the soil. Normally, however, the interaction of all five factors determines the kind of soil that develops in any given place.

Soil formation begins with physical weathering. Large pieces of rock are broken into smaller pieces by frost action, by differential expansion of minerals, by exfolia-

tion, by action of water, ice, and wind, and by the influence of plants and animals. Chemical weathering occurs through the processes of hydrolysis, hydration, oxidation, solution, carbonation, and related processes.

The differences among soils in Litchfield County can be attributed mainly to parent material, relief, and time. The influence of the other soil-forming factors—climate and plants and animals—has been fairly uniform throughout the county, and therefore these factors do not account for important differences among soils. The kinds of rocks that are in glacial drift and the waterborne and windborne materials deposited during the glacial recession and in the postglacial period have provided the parent materials from which the soils have formed. Soils that have different relief differ mainly because of drainage. Soils in alluvial sediments have been affected less than many of the others by soil-forming processes.

The general soil map at the back of this publication shows the location of most geographic features referred to in the following discussion.

Climate

Litchfield County has a humid, continental climate. Winters are long and moderately cool; summers are short and mild. The average annual precipitation is about 46 inches, and the heaviest rainfall normally occurs in June and July. Detailed information on climate is given in the section "General Nature of the County."

Precipitation and temperature affect not only the kind and degree of weathering but also the direction and extent of soil formation. Water percolating through the soil material is instrumental in moving clays and salts from the upper part of the profile to the lower. Soluble salts may be leached from the soil material entirely.

Temperature also has an important effect on soil formation. Rising temperatures increase the rate of weathering and of biological activity. An increase in the mean annual temperature brings about greater microbial activity and hence a more rapid destruction of organic material. In Litchfield County the mineralization of organic matter is fairly rapid in soils that are excessively drained, well drained, or moderately well drained. Peat and muck slowly accumulate in bogs, but here the main soil-forming factor is relief, not climate.

Frost action in the soil tends to affect the structural properties and thereby increases seasonal aggregation within the frost area. This affects the percolation rate and the leaching potential of the soil.

Plant and animal life

Native plants have been a major influence on the development of soils. In Litchfield County the native vegetation consisted mostly of forest. On the well drained and moderately well drained soils, the principal trees were oak, hickory, chestnut, hemlock, and mountain-laurel. The poorly drained and very poorly drained soils were covered with stands of red maple, elm, and water-tolerant shrubs and grasses. These differences in the original plant cover were not sufficiently great to bring about significant differences among the soils of this county.

Rodents, worms, insects, and other animals have contributed to the formation of soils. Earthworms and ants, for example, cause mixing of the soil materials (*11*, *12*). Groundhogs and other burrowing animals bring material from the lower horizons to the surface.

Except for man, however, there is little evidence that any animal has caused important differences among soils in the county. Burning and clearing of forest, cultivation, artificial drainage, the use of fertilizers, and other activities of man have changed the characteristics of many soils. Commonly, the use of of soils by man has brought about erosion of soil material in some places and deposition in others.

Parent material

All of Litchfield County was subject to glaciation during the Pleistocene epoch (*6*). The principal evidence of the Late Wisconsin glacial period is stratified and unstratified glacial drift. Postglacial wind deposits and lake sediments occur but are not extensive. Recent alluvial deposits are fairly extensive.

Litchfield County is located entirely in the Western Highlands. This is a geologic and physiographic region of the State that consists largely of a mass of resistant crystalline acid rocks but also includes a small limestone valley in the northwestern corner of the county. Since earliest time these resistant rocks have been subject to pressure that has tilted and folded them. The most common rocks are schist and gneiss, but others are quartzite, diorite gneiss, granitoid gneiss, granite, Triassic sedimentary rock, basalt, and diabase (*14*).

The Taconic Ridge in the northwestern corner of the county is made up of resistant crystalline rocks known as Salisbury schist. This material has had considerable influence on the soils for miles south of the Taconic Ridge.

The less resistant Stockbridge limestone formation of the limestone valley consists primarily of light-gray, medium-grained to coarse-grained marble made up chiefly of calcite and dolomite, together with certain impurities. Analysis of the rock in the town of Sharon indicates it to be typical dolomite that is 53 percent lime and magnesium. Some limestone materials have been carried beyond the limestone valley but are so diluted that they are of little consequence. The main body of limestone drift lies in the northwestern part of the county and follows intermittently the valley of the Housatonic River to New Milford. This material consists largely of Berkshire limestone and Salisbury schist in various proportions. Where the percentage of limestone decreases, the amounts of schist and gneiss materials increase and the soils grade from the Copake and Groton to the Merrimac and Hinckley soils on the terraces and from the Stockbridge and Dover to the Charlton and other soils on the uplands.

A small isolated area in the southern part of the town of Woodbury is underlain by reddish-brown Triassic sedimentary rocks. From these rocks protrude dikes of highly resistant Triassic rocks commonly known as trap or basalt. Topographically, this area is similar to the surrounding area, and much of the glacial drift from this formation has been diluted with schist and gneiss materials. In scattered areas the soils in this part of the county have a reddish-colored profile because they have

been influenced by reddish rocks. Because the areas have only a small total acreage, some of them were included in areas mapped as other soils.

The detritus left after the glacial ice melted is of variable depth. Some of the rocky areas are covered with none of this material or only a few inches of it, whereas in other areas the depth is as much as 130 feet or more. The average depth to bedrock is probably about 10 feet. Generally, the material was deposited by ice only a short distance from its source.

Both glacial till and glacial outwash, or stratified drift, are common in the county. The till is a heterogenous mixture of stones, sand, silt, and some clay. Most of the till is friable and permeable, but in large areas it is very firm and slowly permeable. The glacial till occurs in drumlins, which are smooth elliptical hills that have been elongated in a general north-south direction by moving ice.

Soils that developed on this till are characterized by a fragipan having platy structure. Drumlins are a recognized feature of the landscape in several towns, including Goshen, Litchfield, and Morris. Some drumlins are as much as one-fourth to one mile long and rise 50 to 100 feet or more above their base. In some places bedrock is exposed at the southern end of a drumlin, and in places a drumlin was formed on a rock core over which the glacial material was compacted.

Glacial outwash consists of sand, gravel, silt, and some clay that were stratified by subglacial streams and melting water from the ice sheet (*6*). These stratified deposits are the present terraces, eskers, kames, and other glacial features laid down on the valley floors and against the valley walls. Collectively, the material is called stratified drift. It is variable in depth and composition. Where it occurs against the valley sides, the stratified drift may be very shallow and bedrock crops out in places. In other areas the material ranges from 10 to more than 30 feet in depth. The composition generally is sand and gravel that have been carried, sorted, and deposited by glacial streams of different velocities. Rounded rocks and boulders are present in some places. In areas of deep sand there are sorted materials consisting of fine sand, coarse sand, fine gravel, and very fine sand. Areas of sand are closely intermingled with areas of sand and gravel.

Glacial drift and glacial outwash are acid, except in the limestone valley where the soil material has been influenced by the Stockbridge limestone. Here, the soils generally are neutral to calcareous in the substratum. Postglacial wind deposits have modified the surface of the soils to a limited extent (*13*). Only in scattered areas, however, have these deposits been a major source of soil materials.

Relief and drainage

Litchfield County lies wholly within the physiographic province called the New England Province. It occupies parts of the two sections, (1) the New England Upland section and (2) the Taconic section with the adjoining limestone valley. In addition, a small islandlike area that is similar to the Connecticut Lowland section occurs at the south-central edge of the county. Collectively, the area covered by the county is known as the Western Highlands.

The New England Upland, the most extensive section, varies considerably in relief. In the southern part of the county, it is gently sloping, sloping, and in a few places, hilly. In the northern part it is generally hilly to steep but includes sloping and gently sloping areas. Narrow valleys dissect the Upland, normally from north to south, and bedrock crops out in a few places on the side walls above the valley floor.

The central part of the county generally is characterized by drumlins and smooth drumloidal hills. The elevation gradually rises from south to north. On drumlin crests the elevation is about 500 feet in New Milford and 1,350 feet in Goshen. To the north the Canaan Mountain rises to a height of about 1,750 feet. The valley floor of the Housatonic River at the southern end of the county is 220 feet above sea level and gradually rises to about 640 feet at the Massachusetts State line.

Two important drainage systems occur in the county—the Housatonic River and the West Branch of the Farmington River. The Housatonic River flows generally in a southerly direction and empties into Long Island Sound. This river and its tributaries drain about 80 percent of the county. Among the main tributaries are the Shepaug, Naugatuck, Pomperaug, and Still Rivers. The northeastern part of the Upland is drained by the West Branch of the Farmington River and its tributaries. This river flows in a general southeasterly direction and empties into the Connecticut River.

The Taconic section is in the northwestern corner of the county and lies high above the floor of the limestone valley. The elevation ranges from about 900 to 2,300 feet. This section is plateaulike and generally is gently sloping or sloping, but it includes steep breaks on the eastern and southern sides and in the areas of Bear, Gridley, and Round Mountains. In most places drainage is to the east and south. Peat and muck bogs are about 1,900 feet above sea level. Riga Lake is at an elevation of 1,750 feet.

The main limestone valley lies to the east and south of the Taconic Ridge. From Canaan to New Milford, the Housatonic River flows through discontinuous limestone formations. In Canaan the valley floor is about 2 miles wide, but it gradually narrows in Cornwall. The soil materials are largely glacial drift and flood plain sediments. The valley walls generally are steep and in places are marked by outcrops of gneiss and schist bedrock. Limestone is commonly exposed in the area. Stratified drift consists of limestone and schist, together with various amounts of other rocks. East and directly south of the Taconic Ridge, the materials contain a large percentage of Salisbury schist. Farther south the limestone sediments have been mixed with gneiss, schist, and quartzite that were carried down from the adjoining hills to the east and west of the valley.

The elevation generally ranges from about 200 feet on the valley floor in New Milford to about 900 feet on the drumloidal hills in Sharon. However, isolated areas of schist adjacent to the valley rise to about 1,500 feet above sea level. The limestone valley lies wholly within the Housatonic River watershed, and tributary streams generally flow in an easterly or westerly direction. The valley floor consists of nearly level alluvial sediments, and above it are nearly level to undulating terraces. The valley walls commonly form steep escarpments adjacent

to the terraces. Outwash materials against the valley walls are sloping to strongly sloping. Islandlike areas of schist on Indian and Red Mountains are very strongly sloping to steep.

A small area in the southern part of the town of Woodbury is underlain by reddish-brown Triassic sedimentary rocks in which there are intrusions of highly resistant Triassic rocks known as traprock. In places these reddish-colored rocks have influenced the color of the soils to some extent.

Time

The last of the Wisconsin glaciers retreated from the area probably between 10,000 and 15,000 years ago. Consequently, the soils are comparatively young and, except in color, the horizons generally are weakly expressed. A good expression of horizon development is the color of the upper B horizon in well drained and moderately well drained soils. In contrast to older soils, the soils of this county show little or no accumulation of silicate clay that would indicate the formation of a textural B horizon. In some soils, however, silt has been moved in the profile, as shown, for example, by silt films and silt caps on rock fragments in the fragipan of the Paxton and Woodbridge soils. Also, there has been leaching of carbonates in the soils derived from limestone, as indicated by limestone ghosts in the solum and, in some places, reprecipitation in the lower C horizon of the Copake and Groton soils. Differences among the soils in Litchfield County have been caused mainly by varying combinations of parent material, relief, and time.

The soils of postglacial or recent alluvial origin are younger than the soils on glacial drift, and they lack even the color development that characterizes the older soils. Soils formed in recent alluvium and in organic deposits continue to receive fresh material.

For more information about the physiography and bedrock geology of Litchfield County, refer to "Physiography of Eastern United States" (*5*) and "Preliminary Geological Map of Connecticut" (*14*).

Classification of Soils

Soils are classified so that we can more easily remember their significant characteristics. Classification enables us to assemble knowledge about the soils, to see their relationships to one another and to the whole environment, and to develop principles that help us in understanding their behavior and their response to manipulation. First through classification and then through the use of soil maps, we can apply our knowledge of soils to specific fields and other tracts of land.

Thus in classification, soils are placed in narrow categories that are used in detailed soil surveys so that knowledge about the soils can be organized and used in managing farms, fields, and woodland; in developing rural areas; in engineering work; and in many other ways. Soils are placed in broad classes to facilitate study and comparison in large areas, such as countries and continents.

Two systems of classifying soils have been used in the United States in recent years. The older system was adopted in 1938 (*2*) and later revised (*18*). The system currently used was adopted for general use by the National Cooperative Soil Survey in 1965. The current system is under continual study. Therefore, readers interested in developments of the current system should search the latest literature available (*17*, *20*).

In table 7, the soil series of Litchfield County are placed in some categories of the current system and in the great soil groups of the older system. Placement of soil series in the current system of classification may change as more precise information becomes available.

The current system of classification has six categories. Beginning with the broadest, these categories are order, suborder, great group, subgroup, family, and series. In this system the criteria used as a basis for classification are soil properties that are observable and measurable. The properties are chosen, however, so that the soils of similar genesis, or mode of origin, are grouped together. The classes that make up the current system are briefly defined in the following paragraphs.

ORDER: Ten soil orders are recognized. Each order is named with a word of three or four syllables ending in *sol*. (Ent-i-sol). The ten orders are Entisols, Vertisols, Inceptisols, Aridisols, Mollisols, Spodosols, Alfisols, Ultisols, Oxisols, and Histosols. The properties used to differentiate the soil orders are those that tend to give broad climatic groupings of soils. Two exceptions, Entisols and Histosols, occur in many different climates.

Table 7 shows the four soil orders in Litchfield County —Entisols, Inceptisols, Spodosols, and Mollisols. In addition, the Histosols order is in the county, but soils classified as Histosols are called Peat and Muck, a land type. Because table 7 lists only soil series, the Histosols order is not shown.

Entisols are mineral soils that have been only slightly modified from the geologic material in which they have been formed. In this county the principal modification is a weakly developed A horizon.

Inceptisols are mineral soils in which horizons have started to develop. They generally occur on young but not recent land surfaces. At the current stage of their development, these soils are not yet in equilibrium with their environment. Their name is derived from the Latin *inceptum*, for beginning.

Spodosols are mineral soils that have horizons in which organic colloids, or iron and aluminum compounds, or both, have accumulated; or they may have thin horizons cemented by iron overlying a fragipan. The name is derived from the Greek *spodos*, meaning wood ash.

Mollisols are mineral soils that developed in material having a high content of calcium carbonate. Their A horizon is relatively rich in organic matter. The name is from the Greek *mollis*, meaning soft.

SUBORDER: Each order is divided into suborders, primarily on the basis of those soil characteristics that seem to produce classes having the greatest genetic similarity. The suborders narrow the broad climatic range permitted in the orders. The soil properties used to separate suborders mainly reflect either the presence or absence of waterlogging or soil differences resulting from the climate or vegetation. Names of suborders have two syllables. The last syllable indicates the order. An example is Aquepts (*Aqu*, meaning water or wet, and *ept*, from Inceptisol).

TABLE 7.—*Soil series classified according to the present system of classification and the 1938 system with its later revisions*

Series	Present classification			1938 classification
	Family	Subgroup	Order	Great soil group
Amenia	Coarse-loamy, mixed, mesic	Aquic Eutrochrepts	Inceptisols	Brown Forest soils.
Au Gres	Sandy, mixed, frigid	Entic Haplaquods	Spodosols	Ground-Water Podzols.
Belgrade	Coarse-silty, mixed, mesic	Aquentic Haplorthods	Spodosols	Brown Podzolic soils.
Bernardston	Coarse-loamy, mixed, mesic	Entic Fragiorthods	Spodosols	Brown Podzolic soils.
Birdsall	Coarse-silty, mixed, nonacid, mesic	Typic Humaquepts	Inceptisols	Humic Gley soils.
Branford	Coarse-loamy, over sandy or sandy-skeletal, mixed, mesic.	Typic Dystrochrepts	Inceptisols	Brown Podzolic soils.
Charlton	Coarse-loamy, mixed, mesic	Entic Haplorthods	Spodosols	Brown Podzolic soils.
Copake	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic.	Dystric Eutrochrepts	Inceptisols	Brown Forest soils.
Deerfield	Sandy, mixed, mesic	Aquentic Haplorthods	Spodosols	Brown Podzolic soils.
Dover	Coarse-loamy, mixed, mesic	Typic Eutrochrepts	Inceptisols	Brown Forest soils.
Eel	Fine-loamy, mixed, mesic	Aquic Fluventic Eutrochrepts	Inceptisols	Alluvial soils.
Enfield	Coarse-silty over sandy or sandy-skeletal, mixed, mesic.	Entic Haplorthods	Spodosols	Brown Podzolic soils.
Farmington	Loamy, mixed, mesic	Lithic Eutrochrepts	Inceptisols	Sols Bruns Acides.
Fredon	Coarse-loamy over sandy or sandy-skeletal, mixed, nonacid, mesic.	Aeric Haplaquepts	Inceptisols	Low-Humic Gley soils
Genesee	Fine-loamy, mixed, mesic	Fluventic Eutrochrepts	Inceptisols	Alluvial soils.
Gloucester	Sandy-skeletal, mixed, mesic	Entic Haplorthods	Spodosols	Brown Podzolic soils.
Granby	Sandy, mixed, noncalcareous, mesic	Typic Haplaquolls	Mollisols	Humic Gley soils.
Groton	Sandy-skeletal, mixed, mesic	Typic Eutrochrepts	Inceptisols	Brown Forest soils.
Hartland	Coarse-silty, mixed, mesic	Entic Haplorthods	Spodosols	Brown Podzolic soils.
Hero	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic.	Aquic Eutrochrepts	Inceptisols	Brown Forest soils.
Hinckley	Sandy-skeletal, mixed, mesic	Entic Haplorthods	Spodosols	Brown Podzolic soils.
Hollis	Loamy, mixed, mesic	Entic Lithic Haplorthods	Spodosols	Brown Podzolic soils.
Holyoke	Loamy, mixed, mesic	Lithic Dystrochrepts	Inceptisols	Sols Bruns Acides.
Kendaia	Fine-loamy, mixed, nonacid, mesic	Aeric Haplaquepts	Inceptisols	Low-Humic Gley soils.
Leicester	Coarse-loamy, mixed, acid, mesic	Typic Haplaquepts	Inceptisols	Low-Humic Gley soils.
Limerick	Coarse-silty, mixed, nonacid, mesic	Fluventic Haplaquepts	Inceptisols	Low-Humic Gley soils.
Lyons	Fine-loamy, mixed, nonacid, mesic	Mollic Haplaquepts	Inceptisols	Humic Gley soils.
Merrimac	Sandy, mixed, mesic	Entic Haplorthods	Spodosols	Brown Podzolic soils.
Ondawa	Coarse-loamy, mixed, mesic	Fluventic Dystrochrepts	Inceptisols	Alluvial soils.
Paxton	Coarse-loamy, mixed, mesic	Entic Fragiorthods	Spodosols	Brown Podzolic soils.
Podunk	Coarse-loamy, mixed, mesic	Aquic Fluventic Dystrochrepts	Inceptisols	Alluvial soils.
Raynham	Coarse-silty, mixed, nonacid, mesic	Aeric Haplaquepts	Inceptisols	Low-Humic Gley soils.
Ridgebury	Coarse-loamy, mixed, mesic	Aeric Fragiaquepts	Inceptisols	Low-Humic Gley soils.
Rumney	Coarse-loamy, mixed, acid, mesic	Fluventic Haplaquepts	Inceptisols	Low-Humic Gley soils.
Saco	Coarse-silty, mixed, nonacid, mesic	Fluventic Haplaquepts	Inceptisols	Humic Gley soils.
Scarboro	Mixed, mesic	Mollic Psammaquents	Entisols	Humic Gley soils.
Shapleigh	Sandy, mixed, mesic	Entic Lithic Haplorthods	Spodosols	Brown Podzolic soils.
Stockbridge	Coarse-loamy, mixed, mesic	Dystric Eutrochrepts	Inceptisols	Brown Podzolic soils.
Sudbury	Sandy, mixed, mesic	Aquentic Haplorthods	Spodosols	Brown Podzolic soils.
Suncook	Mixed, mesic	Typic Udipsamments	Entisols	Alluvial soils.
Sutton	Coarse-loamy, mixed, mesic	Aquentic Haplorthods	Spodosols	Brown Podzolic soils.
Tisbury	Coarse-silty over sandy or sandy-skeletal, mixed, mesic.	Aquentic Haplorthods	Spodosols	Brown Podzolic soils.
Walpole	Sandy, mixed, mesic	Aeric Haplaquepts	Inceptisols	Low-Humic Gley soils.
Wareham, nonacid variant.	Mixed, mesic	Mollic Psammaquents	Entisols	Low-Humic Gley soils.
Whitman	Coarse-loamy, mixed, mesic	Typic Fragiaquepts	Inceptisols	Humic Gley soils.
Windsor	Sandy, mixed, mesic	Entic Haplorthods	Spodosols	Brown Podzolic soils.
Woodbridge	Coarse-loamy, mixed, mesic	Aquentic Fragiorthods	Spodosols	Brown Podzolic soils.

GREAT GROUP: Soil suborders are separated into great groups on the basis of uniformity in the kinds and sequence of major soil horizons and features. The horizons used to make separations are those in which clay, iron, or humus has accumulated or those that have pans interfering with growth of roots or movement of water. The features used are self-mulching properties of clays, major differences in chemical composition (mainly calcium, magnesium, sodium, and potassium), and the like.

The names of great groups have three or four syllables and are made by adding a prefix to the name of the suborder. An example is Humaquept (*Hum*, for the presence of humus, *aqu*, for wetness or water, and *ept*, from Inceptisol). The great group is not shown separately in table 7, because the name of the great group is the last word in the name of the subgroup.

SUBGROUP: Great groups are divided into subgroups, one representing the central (typic) segment of the group and others, called intergrades, that have properties of one great group and also one or more properties of another great group, subgroup, or order. Subgroups may also be made in those instances where soil properties intergrade outside of the range of any other great group, subgroup, or order. The names of subgroups are derived by placing one or more adjectives before the name of the great group. An example is Typic Humaquept (a typical Humaquept).

FAMILY: Families are separated within a subgroup primarily on the basis of properties important to the growth of plants or behavior of soils where used for engineering. Among the properties considered are texture, mineralogy, reaction, soil temperature, and thickness of horizons. An example is the coarse-silty, mixed, nonacid, mesic family of Typic Humaquepts.

SERIES: The series consists of a group of soils that formed from a particular kind of parent material and have genetic horizons that, except for texture of the surface soil, are similar in differentiating characteristics and in arrangement in the profile. Among these characteristics are color, structure, reaction, consistence, and mineralogical and chemical composition.

General Nature of the County

In this section the settlement and growth of Litchfield County are briefly discussed and information is given about industries, transportation, markets, and agriculture. Also in this section is a discussion of the climate and its effect on farming.

Settlement and Growth

Litchfield County was formed as the fifth county of the State in 1751, though settlement of the area began many years before that time. Colonists traveled up the Housatonic River from Long Island Sound and settled along the Housatonic and Pomperaug Rivers and their tributaries. Early settlements were founded in what are now the towns of New Milford and Woodbury.

The early growth of the county consisted mainly of an expansion in the acreage used for farming. Later, when waterpower was developed and railroads were built, came industries and commercial agriculture.

By 1796, there were 283,000 acres in farms and 45,600 acres for tilled crops. General farming was dominant in the county until about 1870, but by that time the transition to dairying and poultry farming was well under way.

Industries, Transportation, and Markets

Although the county is mainly agricultural, industries have been built along the valley of the Naugatuck River, principally in Winsted, Torrington, Thomaston, and Oakville. Also, there has been recent expansion of light industries in the town of New Milford and, to a lesser extent, in the towns of Canaan and Watertown. Some of the principal manufactured products are wire, brass products, ball bearings, needles, and time pieces. Others are electronic components, timing devices, paper products, medicinal supplies, and parts for the aircraft and electrical industries.

Limestone is quarried for farm use in North Canaan and Canaan. In Woodbury a traprock quarry produces crushed rock for roadbuilding and other uses. Washed gravel and sand are prepared locally for various construction purposes, and in a few places peat is processed from bogs. In addition, there are several sawmills that manufacture lumber from logs cut locally.

The county is well provided with transportation facilities. In addition to railroads, the county is served by bus lines and highway express trucks. The main highways are U.S. Route 7 and Connecticut Routes 8 and 25, all of which extend north and south through the valleys. Other highways are U.S. Routes 6 and 202 in the southeastern part of the county and U.S. Route 44 in the northern part.

The county is easily accessible to markets in Hartford, Waterbury, and Danbury, Conn.; Springfield, Mass.; and Poughkeepsie, N.Y. New York City is about 100 miles to the southwest, and Boston is about 114 miles to the northeast.

Agriculture

Litchfield County is the leading dairy county in the State, and the most important farm enterprise is producing crops in support of dairying. According to the U.S. Bureau of the Census, the principal crops are hay crops, corn, and small grains. In 1964, the acreage of these and other important crops, as well as the number of fruit trees, was as follows:

	Acres
Corn	8,364
For grain	284
Mainly for silage	7,902
Hay crops, total	39,112
Alfalfa and alfalfa mixtures	10,649
Clover and grasses	17,400
Small grain cut for hay	463
Other hay cut	7,542
Silage from grasses, legumes, and small grains	3,058
Wheat, oats, and rye harvested	580
Irish potatoes for home use or for sale	30
Vegetables other than potatoes and sweetpotatoes	290
	Number
Apple trees of bearing age	11,547
Peach trees of bearing age	2,912

The number of livestock and poultry on farms in 1964 was as follows:

	Number
Cattle and calves	34, 503
Milk cows	20, 938
Hogs and pigs	935
Sheep and lambs	986
Chickens	248, 514

After the damaging flood of 1955, the U.S. Army Corps of Engineers and local authorities constructed a series of dams for controlling floods in the county. The areas behind these dams normally serve as refuges for wildlife, and some of them have been developed for recreation. A small watershed project involving the construction of smaller dams has been undertaken along the Blackberry River in North Canaan by local authorities cooperating with the State of Connecticut and the Soil Conservation Service.

Climate [4]

Litchfield County has a humid continental climate, classified as a snow-forest type with warm summers. The prevailing westerly wind, blowing from the southwest in summer but from the northwest during other periods of the year, maintains the dominantly continental character of the climate. The pattern is often interrupted, however, by the arrival of maritime air from the Atlantic Ocean to the south and east.

Because the county is located near the principal storm tracks, the weather frequently changes from day to day as air flows alternately from northern and southern regions. Many kinds of crops can be grown in the county, because monthly mean temperatures average 50° F. or higher for 6 months each year, except on many of the higher north-facing slopes. The mean temperature generally averages about 70° in July and 24° in January, but it is about 3° lower on slopes facing north. Mild temperatures in summer favor the growth of hay crops, which are then barn fed to livestock during the colder half of the year.

Differences in elevation and exposure can cause local variations in the climate. Table 8 gives temperature and precipitation data compiled from records of the U.S. Weather Bureau for the cooperative stations at Cream Hill, Falls Village, and Norfolk. Cream Hill, in the town of Cornwall, is typical of most locations on hills, especially those having a southerly exposure. It most nearly approaches the theoretical average location for the county. Norfolk is representative of north-facing hilltops, particularly the higher ones in the rugged terrain in the north. Falls Village, on the Housatonic River, is representative of valley locations throughout the county. It is surrounded by hills from which a considerable amount of cold air drains into the valley bottom.

In table 9 the average frequencies of specified important temperature levels are shown for the three locations by months. The table indicates that the weather is seldom excessively hot and that prolonged periods of extreme cold are rare. In an average summer in the valleys and on south-facing slopes, the temperature rises to 90° or higher on 6 to 12 days. On north-facing slopes of higher hilltops, however, where heating is tempered by wind, the temperature in an average summer reaches 90° or more only on 1 day to 5 days. In most places an average summer reaches 90° or more only on 1 day to 5 days. In most places an average winter has 30 to 50 days when the maximum temperature does not rise above 32°, but in some higher north-facing locations the number of days increases to almost 65.

Rainfall is plentiful in the county. The average yearly amount ranges from 44 to 52 inches, and the greatest amount falls on the Litchfield plateau and along the eastern slopes of the highlands. The precipitation is well distributed throughout the year. Its abundance assures that water will be available for irrigation during the fairly common, though rarely prolonged, dry spells that occur in the growing season.

Snowfall varies considerably from season to season, but the average seasonal total is between 40 and 50 inches in the southern part of the county and between 50 and 100 inches in the northern part. A low total snowfall is rare except in the extreme southwestern part of the county, where as little as 15 inches of snow may fall in a mild winter but more than 65 inches fall 1 year in 10. In the northern hills, during the 35-year period from 1931 to 1966, the total seasonal snowfall at Norfolk ranged from 56 to 177 inches. The total exceeded 80 inches in three-fourths of these seasons; a snowfall of more than 125 inches was recorded during 6 winters; and almost 74 inches fell in a single March.

Significant snowfall occurs from mid-November to mid-April during more than 85 percent of the winters. At Norfolk, the probability of the greatest 24-hour seasonal snowfall exceeding 12 inches is a little more than 1 in 2; 25 inches, 1 in 5; and 33 inches, 1 in 100. In the southwestern part of the county, where snowfall is least, 1 year in 4 has a maximum 24-hour snowfall of 12 inches, and only 1 year in 100 has a maximum 24-hour snowfall in excess of 22 inches.

Although widespread and severe icing is infrequent, a significant ice storm occurs nearly every winter. Generally, there are about 12 days a year in which glaze ice occurs, but the number ranges from 6 to 24.

In table 8 it should be noted that some data are for specific risk levels. These are given because they are less dependent on the length of record than the usual extremes and may be more suitable for planning. The temperature values, both maximum and minimum, that occur on at least 4 days in the month and in 2 years out of 10 are very nearly the same as the average monthly extremes. The long-period average of the monthly extremes is 0° to 4° higher for the maximum and 1° to 4° lower for the minimum than the risk values given.

Table 10 shows mean monthly and yearly heating degree-days for Cream Hill, Falls Village, and Norfolk. The number of heating degree-days for a given day is equal to a base temperature of 65° F., less the mean temperature for that day. The total number of heating degree-days for a month is simply the sum of all the daily values. The base temperature of 65° is the lowest daily mean temperature for which no home heating is considered necessary. For example, on a day having

[4] By JOSEPH J. BRUMBACH, State climatologist for Connecticut and Rhode Island, Environmental Science Services Administration, U.S. Department of Commerce.

TABLE 8.—*Temperature and precipitation*

Month	Temperature					Precipitation						
	Average daily			Two years in 10 will have at least 4 days with—		Average total	One year in 10 will have—		Snowfall average	Days with—		
	Maximum	Minimum	Mean	Maximum temperature equal to or higher than—	Minimum temperature equal to or lower than—		Less than—	More than—		Snow of 1 inch or more	Snow cover of 1 inch or more	Precipitation of 0.10 inch or more
	° F.	° F.	° F.	° F.	° F.	Inches	Inches	Inches	Inches	Days	Days	Days
CREAM HILL, CORNWALL, ELEVATION 1,300 FEET												
January	31.8	16.2	24.0	48	−2	3.3	2.0	5.4	17.3	6	21	8
February	34.1	17.3	25.7	48	2	2.9	1.8	5.0	14.2	5	21	7
March	42.4	24.8	33.6	60	10	3.6	1.7	5.9	14.0	5	17	8
April	55.8	35.3	45.6	76	24	3.7	1.9	5.7	4.6	1	2	9
May	67.7	46.1	56.9	82	35	3.6	1.6	5.9	(1)	(2)	0	8
June	74.5	54.8	65.4	87	45	4.3	1.7	7.0	0	0	0	8
July	80.5	60.1	70.1	88	52	4.5	1.9	7.4	0	0	0	7
August	78.4	58.4	68.4	89	49	3.9	1.9	6.8	0	0	0	7
September	71.5	51.1	61.3	84	39	4.1	1.4	7.4	0	0	0	6
October	61.5	42.1	51.8	75	28	3.3	1.2	6.4	.2	(2)	(2)	6
November	47.8	31.8	40.0	63	19	4.0	1.4	6.4	5.4	1	3	7
December	35.1	20.0	27.5	52	3	3.6	1.8	6.1	10.8	4	14	8
Year	56.8	38.2	47.5	[3] 92	[4] −8	44.8	36.3	56.9	61.1	22	78	89
FALLS VILLAGE, ELEVATION 580 FEET												
January	34.7	13.5	24.1	51	−8	3.1	1.7	5.1	17.0	5	17	7
February	37.2	15.0	26.1	52	−5	2.4	1.6	4.6	11.5	4	15	6
March	45.7	23.2	34.4	65	5	3.1	1.3	5.5	9.3	4	11	7
April	59.3	32.6	46.0	80	20	3.8	1.7	5.6	1.9	(2)	1	8
May	72.3	42.7	57.5	86	29	3.6	1.8	5.7	(1)	(2)	(2)	8
June	78.9	51.5	65.7	90	39	4.3	1.8	6.7	0	0	0	7
July	83.9	56.2	70.1	92	45	3.9	1.8	7.5	0	0	0	7
August	81.7	55.0	68.3	92	43	3.8	1.3	6.8	0	0	0	6
September	74.1	47.8	60.9	87	32	3.9	1.3	7.9	0	0	0	6
October	64.1	36.9	50.4	77	24	3.1	1.2	5.8	(1)	0	0	5
November	50.8	28.1	39.5	66	14	3.8	1.3	6.0	3.7	1	2	7
December	37.9	17.3	27.6	54	−3	3.2	1.7	4.9	9.2	3	9	7
Year	60.1	35.0	47.6	[3] 93	[4] −14	42.0	32.3	52.7	52.6	17	55	81
NORFOLK, ELEVATION 1,337 FEET												
January	29.1	12.2	20.7	45	−7	4.2	3.0	5.8	22.6	6	26	8
February	30.8	12.7	21.8	46	−7	3.8	2.8	4.6	21.6	5	25	8
March	39.0	21.2	30.1	58	3	4.6	2.4	5.9	21.1	5	24	9
April	52.9	32.7	42.8	75	21	4.3	3.0	6.2	7.8	2	8	9
May	66.0	43.4	54.7	82	31	4.1	1.9	5.6	.3	(2)	(2)	9
June	73.7	52.3	63.0	85	41	4.6	2.7	6.8	(1)	0	0	8
July	78.1	57.2	67.7	87	46	3.9	2.4	5.5	0	0	0	8
August	75.9	55.6	65.8	87	45	4.4	2.7	5.3	0	0	0	7
September	68.5	48.3	58.4	82	35	4.4	2.1	6.0	(1)	0	0	6
October	57.8	38.2	48.0	73	26	3.9	1.9	5.1	.6	(2)	(2)	6
November	44.6	28.7	36.7	60	15	4.9	2.8	7.1	8.0	2	5	8
December	32.1	16.8	24.5	49	−2	4.5	2.9	6.0	16.1	4	19	8
Year	54.0	34.9	44.5	[3] 90	[4] −10	51.6	41.8	58.2	98.1	26	107	94

[1] Trace.
[2] Less than one-half day.
[3] Average annual highest maximum.
[4] Average annual lowest minimum.

TABLE 9.—*Average frequencies of selected temperature levels at three typical locations in the county*

Month	Mean number of days with temperature (° F.)—											
	Maximum						Minimum					
	90° or higher			32° or lower			32° or higher			0° or lower		
	Cream Hill [1]	Falls Village [2]	Norfolk [3]	Cream Hill	Falls Village	Norfolk	Cream Hill	Falls Village	Norfolk	Cream Hill	Falls Village	Norfolk
	Days	*Days*	*Days*	*Days*	*Days*	*Days*	*Days*	*Days*	*Days*	*Days*	*Days*	*Days*
January	0	0	0	16	12	20	29	30	30	3	5	5
February	0	0	0	12	8	16	27	27	28	2	4	4
March	0	0	0	5	3	9	25	26	28	(4)	1	1
April	0	0	0	0	0	(4)	12	15	16	0	0	0
May	0	0	0	0	0	0	1	5	3	0	0	0
June	1	3	(4)	0	0	0	0	0	(4)	0	0	0
July	1	5	1	0	0	0	0	0	0	0	0	0
August	1	3	(4)	0	0	0	0	0	(4)	0	0	0
September	0	1	(4)	0	0	0	1	2	1	0	0	0
October	0	0	0	0	0	(4)	4	11	9	0	0	0
November	0	0	0	2	1	3	17	21	21	0	0	(4)
December	0	0	0	13	8	16	28	29	29	1	3	3
Year	3	12	1	48	32	64	144	166	165	6	12	13

[1] Elevation 1,300 feet.
[2] Elevation 580 feet.
[3] Elevation 1,337 feet.
[4] Less than one-half day.

a mean temperature of 40°, the number of heating degree-days is 65° minus 40°, or 25. On the average there is an increase of 120 in the annual number of heating degree days from the southern part of the county to the north-central part.

TABLE 10.—*Mean monthly and seasonal heating degree-days*

Month	Station		
	Cream Hill (elevation 1,300 feet)	Falls Village (elevation 580 feet)	Norfolk (elevation 1,337 feet)
	Degree-days	*Degree-days*	*Degree-days*
July	0	0	16
August	34	40	65
September	141	147	210
October	419	453	524
November	762	753	852
December	1, 159	1, 153	1, 256
January	1, 249	1, 234	1, 342
February	1, 106	1, 086	1, 207
March	983	955	1, 088
April	582	589	660
May	264	251	313
June	60	30	93
Season	6, 759	6, 691	7, 626

Table 11 gives, for three probabilities, the number of growing degree days likely in each 7-day period from April 5 through October 10. The data are for Cream Hill, the station that most nearly represents average conditions in the county.

Growing degree-days are calculated similarly to heating degree-days, except that they are determined by the daily mean temperatures in excess of the base. The base temperature is chosen according to the crop and should be the temperature below which no growth takes place. There are distinct differences among plants in their response to specific temperatures. Ideally, a different base would be selected for each crop, but the usual practice is to settle for two standard base values—40° for grasses, peas, and other cool-weather crops and 50° for corn and other warm-weather crops.

As shown in table 11, if the base temperature is 40°, the probability is 20 percent, or 1 year in 5, that there will be fewer than 191 growing degree-days at Cream Hill and similar locations during the week of July 5 through July 11. For a 50° base, the probability is 50 percent that fewer than 40 growing degree-days will occur in the week of May 3 through May 9. The number of growing degree-days in the wider valleys in the southern part of the county is higher than those in the table, and the number is smaller in the higher north-facing areas and the narrow valleys to the north.

In Litchfield County the average growing season begins late in April for grasses and hardy crops and late in May for tender crops. It comes to an end for most crops early in October. Table 12 shows the probability of freezing temperatures in spring and in fall at Cream Hill. Although the table indicates that the average freeze-free season is 158 days at Cream Hill, the average growing season is somewhat longer, or about 165 days, on south-facing slopes along the southern edge of the county, and it is considerably shorter, or about 125 days, at most valley locations and on higher north-facing slopes. Generally, where the growing season is short, 1 year in 15 has a freezing temperature in June and 1 year in 30 has a freeze in August. In the higher valleys, frost is a threat 1 year in 2 in June, 1 year in 30 in July, and 1 year in 4 in August.

Table 13 lists selected percentages of probability that specified amounts of precipitation will fall in 1-week periods at Cream Hill during the growing season. The periods do not overlap. Similar information for 2-week periods is given in table 14. In table 13, for ex-

TABLE 11.—*Probability of receiving growing degree-days less than the number indicated*

[Cream Hill, Cornwall, elevation 1,300 feet]

Week	Base 40° F.[1]			Base 50° F.[2]		
	20 percent	50 percent	80 percent	20 percent	50 percent	80 percent
	Degree-days	*Degree-days*	*Degree-days*	*Degree-days*	*Degree-days*	*Degree-days*
April 5 through April 11	13	32	51	0	7	16
April 12 through April 18	19	39	59	0	10	21
April 19 through April 25	35	59	83	3	17	31
April 26 through May 2	48	73	98	8	24	40
May 3 through May 9	75	102	129	20	40	60
May 10 through May 16	75	102	129	18	38	58
May 17 through May 23	94	122	150	31	54	77
May 24 through May 30	109	136	164	43	67	91
May 31 through June 6	126	153	180	59	84	109
June 7 through June 13	138	165	192	70	95	120
June 14 through June 20	146	172	198	77	102	127
June 21 through June 27	166	190	214	95	120	145
June 28 through July 4	173	197	221	103	127	151
July 5 through July 11	191	212	233	120	142	164
July 12 through July 18	186	208	230	115	138	161
July 19 through July 25	194	214	234	122	144	166
July 26 through August 1	196	217	238	126	147	168
August 2 through August 8	183	205	227	112	135	158
August 9 through August 15	185	207	229	114	137	160
August 16 through August 22	170	193	216	99	123	147
August 23 through August 29	159	184	209	89	114	139
August 30 through September 5	158	183	208	88	113	138
September 6 through September 12	136	163	190	68	93	118
September 13 through September 19	121	148	175	54	79	104
September 20 through September 26	102	130	158	39	62	85
September 27 through October 3	80	107	134	23	44	65
October 4 through October 10	76	103	130	21	42	63

[1] The base for cool-weather crops. [2] The base for warm-weather crops.

TABLE 12.—*Probability of freezing temperatures in spring and fall*

[Cream Hill, Cornwall, elevation 1,300 feet]

Probability	Dates for given probability and temperature				
	32° F. or lower	28° F. or lower	24° F. or lower	20° F. or lower	16° F. or lower
Spring:					
1 year in 10, later than	May 20	May 9	April 29	April 16	April 5
2 years in 10, later than	May 15	May 4	April 23	April 11	March 31
5 years in 10, later than	May 3	April 22	April 11	April 1	March 21
8 years in 10, later than	April 27	April 17	April 5	March 27	March 16
Fall:					
1 year in 10, earlier than	September 24	October 7	October 19	October 31	November 10
2 years in 10, earlier than	September 28	October 11	October 25	November 5	November 15
5 years in 10, earlier than	October 8	October 22	November 6	November 16	November 27
8 years in 10, earlier than	October 17	November 3	November 18	November 30	December 11

TABLE 13.—*Probability of receiving trace or less of precipitation or at least the amounts indicated during 1-week periods*

[Cream Hill, Cornwall, elevation 1,300 feet]

Week	Precipitation						
	Trace or less	0.10 inch	0.20 inch	0.40 inch	1.00 inch	2.00 inches	4.00 inches
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
April 12 through April 18	4	92	85	71	33	8	1
April 19 through April 25	6	89	81	66	32	8	1
April 26 through May 2	8	87	90	64	29	6	(1)
May 3 through May 9	8	87	79	64	30	7	(1)
May 10 through May 16	9	87	82	69	36	11	1
May 17 through May 23	7	88	82	69	38	13	1
May 24 through May 30	6	89	82	69	38	14	2
May 31 through June 6	7	88	82	70	39	13	1
June 7 through June 13	7	88	83	71	42	17	3
June 14 through June 20	4	91	86	74	44	17	3
June 21 through June 27	3	91	85	73	44	18	4
June 28 through July 4	3	92	86	74	42	14	1
July 5 through July 11	7	88	82	69	38	13	1
July 12 through July 18	4	89	81	68	34	14	2
July 19 through July 25	6	84	75	61	33	13	2
July 26 through August 1	5	85	77	62	35	12	2
August 2 through August 8	5	87	79	65	38	12	2
August 9 through August 15	7	87	80	67	40	15	3
August 16 through August 22	9	83	76	65	36	18	4
August 23 through August 29	12	78	71	60	32	17	4
August 30 through September 5	11	79	70	57	36	13	2
September 6 through September 12	10	81	74	61	31	15	3
September 13 through September 19	12	77	68	55	32	13	3
September 20 through September 26	17	74	67	56	25	14	3
September 27 through October 3	20	71	63	51	27	8	1
October 4 through October 10	18	73	65	52	27	9	1

[1] Less than 0.5 percent.

TABLE 14.—*Probability of receiving trace of precipitation or less or at least the amounts indicated during 2-week periods*

[Cream Hill, Cornwall, elevation 1,300 feet]

Period	Precipitation							
	Trace or less	0. 40 inch	0. 80 inch	1. 40 inches	2. 00 inches	2. 80 inches	4. 00 inches	6. 00 inches
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
April 12 through April 25	0	93	78	53	33	16	5	1
April 26 through May 9	0	93	75	47	27	12	3	(1)
May 10 through May 23	2	94	83	62	40	20	6	1
May 24 through June 6	2	96	87	66	43	21	6	1
June 7 through June 20	1	94	83	64	47	30	15	4
June 21 through July 4	0	96	86	66	48	29	13	3
July 5 through July 18	0	95	83	61	41	23	8	1
July 19 through August 1	0	91	76	54	36	20	8	2
August 2 through August 15	0	91	77	56	39	23	10	3
August 16 through August 29	2	86	73	56	42	28	15	5
August 30 through September 12	1	88	74	53	37	22	10	3
September 13 through September 26	2	85	70	50	35	21	10	3
September 27 through October 10	6	77	59	39	25	14	5	1

[1] Less than 0.5 percent.

ample, the probability that Cream Hill will receive a trace of rain or none during the week of July 26 through August 1 is 5 percent. The probability of receiving 0.20 inch or more during that week is 77 percent. That is, in 1 year out of 20 the rainfall is expected to be a trace or 0, and in 77 years out of 100 it is expected to total 0.20 inch or more during the period July 26 through August 1.

Because Litchfield County is 25 to 50 miles inland from the Atlantic Ocean, it is much less susceptible to damage from hurricanes and intense coastal storms than counties adjoining the ocean. On an average, however, major damage from these storms has occurred in about 1 year in 6. Tornadoes may occur more frequently, but some of these probably go unreported because they hit in remote areas. Since 1951 there have been 12 known tornadoes in the county on 5 separate days.

Cream Hill and Falls Village each has had thunderstorms on an average of 21 days annually over the past 30 years, but Norfolk has had such storms on an average of 34 days annually. In other parts of the county, thunderstorms probably occur on 17 to 35 days a year; the greatest number is in areas where the air is forcibly lifted over rugged terrain.

Although lightning damage to property and occasionally to animals is more spectacular, soil erosion and plant injury from heavy rainfall accompanying thunderstorms are of greater concern to agriculture. Thunderstorms have occurred in every month of the year, but they are most frequent in June and July. At Cream Hill and Falls Village, thunderstorms occur on 4 or 5 days in both June and July, but the number of such storms in each of these months is 7 or 8 at Norfolk. In any given location storms are accompanied by hail once or twice a year. Hailstorms rarely bring stones of sufficient size and number to cause extensive damage.

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Glossary

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available moisture capacity. The capacity of a soil to hold water in a form available to plants. Amount of moisture held in soil between field capacity, or about one-third atmosphere of tension, and the wilting coefficient, or about 15 atmospheres of tension.

Channery soil. A soil that contains thin, flat fragments of sandstone, limestone, or schist, as much as 6 inches in length along the longer axis. A single piece is called a fragment.

Chroma. See Color, Munsell notation.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Close-growing crops. Crops such as alfalfa, grasses, and grass-legume mixtures that are grown for silage or forage. These crops are generally grown in a rotation with row crops.

Coarse fragments. Rocks and minerals in the soil that are larger than 2 millimeters in diameter. They include gravel, cobblestones, stones, and boulders.

Color, Munsell notation. A system for designating colors by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with a hue of 10YR, a value of 6, and a chroma of 4.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent; will not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour or are parallel to terraces or diversions. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Crystalline rock. A general term that includes both igneous and metamorphic rocks; a term used for rocks composed of crystals or parts of crystal.

Diversion terrace. An embankment or ridge with a shallow ditch on the upper side constructed nearly parallel to the slope to direct runoff to an outlet and thus protect areas downslope from erosion.

Drumlin. An oval hill of glacial drift, normally compact and unstratified, generally with its longer axis parallel to the movement of the ice responsible for its deposition.

Esker. A narrow ridge or mound of gravelly and sandy drift deposited by a subglacial stream.

Fertility, soil. The quality that enables a soil to provide the proper elements in the proper amounts and in the proper balance for the growth of specified plants when other factors such as light, temperature, and the physical condition of the soil are favorable.

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

Fluvial deposits. Materials deposited by rivers. When rivers emanate from melting glaciers, the deposits are sometimes called glaciofluvial deposits.

Fragipan. A loamy brittle, subsurface horizon that is very low in organic matter and clay but is rich in silt or very fine sand. The layer is seemingly cemented when dry, has a hard or very hard consistence, and has a high bulk density in comparison with the horizon or horizons above it. When moist, the fragipan tends to rupture suddenly if pressure is applied, rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick; they generally occur below the B horizon, 15 to 40 inches below the surface.

Glacial drift. The material picked up, mixed, disintegrated, transported, and deposited by glacial ice or by water melted from the glacial ice. In many places the glacial drift is covered by windblown sediments.

Glaciofluvial deposits. The materials moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice; the deposits are stratified and occur in the form of kames, eskers, deltas, and outwash plains.

Gleization. The reduction, translocation, and segregation of soil compounds, notably of iron, usually in the subsoil or substratum, as a result of poor aeration and drainage; expressed in the soil by mottled colors dominated by gray. The soil-forming processes leading to the development of a gley soil.

Gleyed soil. A soil in which waterlogging and lack of oxygen have caused the material in one or more horizons to be neutral gray in color. The term "gleyed" is applied to soil horizons with yellow and gray mottling caused by intermittent waterlogging.

Graded stripcropping Growing alternate strips of sod and row crops generally along contours of the land but graded slightly to prevent accumulation of surface runoff in areas of impeded drainage.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons.

O horizon.—The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon.—The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and it is therefore marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or some combination of these; (2) prismatic or blocky structure; (3) redder or stronger colors than the A horizon or (4) some combination of these. The combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The weathered rock material immediately beneath the solum. This layer, commonly called the soil parent material is presumed to be like that from which the overlying horizons were formed in most soils. If the underlying material is know to be different from that in the solum, a Roman numeral precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath the A or B horizon.

Hue. See Color, Munsell notation.

Internal soil drainage. The downward movement of water through the soil profile. The rate of movement is determined by the texture, structure, and other characteristics of the soil profile and underlying layers, and by the height of the water table, either permanent or perched. Relative terms for expressing internal drainage are *none, very slow, slow, medium, rapid,* and *very rapid.*

Kames. A short, irregular ridge, hill, or hillock of stratified glacial drift. Most kames are interspersed with depressions, called kettles, that have no surface drainage.

Limestone ghost. A porous earthy mass of silica and iron oxide residue that remains after the calcium carbonate matrix has been weathered and leached by solution.

Mottled. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: Abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are these: *Fine,* less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium,* ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse,* more than 15 millimeters (about 0.6 inch in diameter along the greatest dimension.

Natural drainage. Refers to the conditions that existed during the development of the soil as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven different classes of natural drainage are recognized.

Excessively drained soils are commonly very porous and rapidly permeable and have a low water-holding capacity.

Somewhat excessively drained soils are also very permeable and are free from mottling throughout their profile.

Well-drained soils are nearly free from mottling and are commonly of intermediate texture.

Moderately well drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A and upper B horizons and have mottling in the lower B and the C horizons.

Imperfectly or somewhat poorly drained soils are wet for significant periods but not all the time, and in podzolic soils mottles are common below 6 to 16 inches in the lower A horizon and in the B and C horizons.

Poorly drained soils are wet for long periods and are light gray and generally mottled from the surface downward, although mottling may be absent or nearly so in some soils.

Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling, in the deeper parts of the profile.

Parent material, soil. The weathered rock or partly weathered soil material from which soil has formed; the C horizon.

Permeability. The quality of a soil horizon that enables water or air to move through it. Terms used to describe permeability are as follows: *Very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

pH value. A numerical means for designating relatively weak acidity and alkalinity in soils. A pH value of 7.0 indicates precise neutrality; a higher value alkalinity; and a lower value, acidity. See Reaction, soil.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that has a pH of 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid.	Below 4.5	Neutral	6.6 to 7.3
		Mildly alkaline	7.4 to 7.8
Very strongly acid.	4.5 to 5.0	Moderately alkaline.	7.9 to 8.4
Strongly acid	5.1 to 5.5	Strongly alkaline	8.5 to 9.0
Medium acid	5.6 to 6.0	Very strongly alkaline.	9.1 and higher
Slightly acid	6.1 to 6.5		

Relief. The elevations or inequalities of a land surface, considered collectively.

Runoff. The surface flow of water over an area. The amount and rapidity of runoff are affected by texture, structure, and porosity of the surface soil; by vegetation; by prevailing climate; and by slope. The degree of runoff is expressed by the terms: *Very rapid, rapid, medium, slow, very slow,* and *ponded.*

Sand. Individual rock or mineral fragments in soils having diameters ranging from 0.05 millimeter to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Soil. A natural, three-dimensional body on the earth's surface that supports plants and that has properties resulting from the integrated effect of climate and living matter acting upon parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles, less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows: *Very coarse sand* (2.0 millimeters to 1.0 millimeter); *coarse sand* (1.0 to 0.5 millimeter); *medium sand* (0.5 to 0.25 millimeter); *fine sand* (0.25 to 0.10 millimeter); *silt* (0.05 to 0.002 millimeter); and *clay* (less than 0.002 millimeter). The separates recognized by the International Society of Soil Science are as follows: I (2.0 millimeters to 0.2 millimeter); II (0.2 to 0.02 millimeter); III (0.02 to 0.002 millimeter); IV (less than 0.002 millimeter).

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristic of the soil are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are (1) *single grain* (each grain by itself, as in dune sand) or (2) *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the profile below plow depth.

Substratum. Any layer lying beneath the solum, or true soil; the C or R horizon.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 or 8 inches in thickness. The plowed layer.

Terrace (geological). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Topsoil. A presumed fertile soil or soil material, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

Upland (geological). Land consisting of material unworked by water in recent geologic time and ordinarily lying at a higher elevation than the alluvial plain or stream terrace.

Value. See Color, Munsell notation.

Variant, soil. A soil having properties sufficiently different from other known soils to justify a new series name but occupying a geographic area so limited that creation of a new series is not believed to be justified.

Water table. The highest part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

GUIDE TO MAPPING UNITS--Continued

Map symbol	Mapping unit	Described on page	Capability unit		Woodland group		Urban group	
			Symbol	Page	Number	Page	Number	Page
SpC	Stockbridge stony loam, 8 to 15 percent slopes------	85	IVes-2	11	2	18	6	43
SpD	Stockbridge stony loam, 15 to 25 percent slopes-----	85	VIes-2	13	3	19	7	43
SrC	Stockbridge very stony loam, 3 to 15 percent slopes-	85	VIs-2	13	7	20	6	43
SrD	Stockbridge very stony loam, 15 to 35 percent slopes---	85	VIIs-2	14	8	20	7	43
St	Suncook loamy fine sand----------------------------	86	IIIs-1	10	6	20	13	45
SvA	Sutton fine sandy loam, 0 to 3 percent slopes-------	87	IIw-1	8	1	18	8	43
SvB	Sutton fine sandy loam, 3 to 8 percent slopes-------	87	IIwe-1	8	1	18	8	43
SwA	Sutton stony fine sandy loam, 0 to 3 percent slopes-	87	IVws-1	11	1	18	8	43
SwB	Sutton stony fine sandy loam, 3 to 8 percent slopes-	87	IVws-1	11	1	18	8	43
SxA	Sutton very stony fine sandy loam, 0 to 3 percent slopes--	87	Vs-1	12	7	20	8	43
SxC	Sutton very stony fine sandy loam, 3 to 15 percent slopes---	87	VIs-1	13	7	20	8	43
Tg	Terrace escarpments--------------------------------	88	VIe-3	13	6	20	7	43
TwA	Tisbury and Sudbury soils, 0 to 3 percent slopes---	88	IIw-1	8	1	18	8	43
TwB	Tisbury and Sudbury soils, 3 to 8 percent slopes---	88	IIwe-1	8	1	18	8	43
Wl	Walpole and Raynham soils--------------------------	89	IIIw-1	10	4	19	11	45
Wmx	Wareham loamy fine sand, nonacid variant-----------	90	IIIw-1	10	4	19	11	45
Wp	Whitman stony fine sandy loam----------------------	90	Vws-1	12	5	19	12	45
WvA	Windsor loamy fine sand, 0 to 3 percent slopes-----	91	IIIs-1	10	6	20	1	41
WvB	Windsor loamy fine sand, 3 to 8 percent slopes-----	91	IVse-1	11	6	20	1	41
WvC	Windsor loamy fine sand, 8 to 15 percent slopes----	91	IVse-1	11	6	20	2	41
WxA	Woodbridge fine sandy loam, 0 to 3 percent slopes--	92	IIw-2	8	1	18	9	44
WxB	Woodbridge fine sandy loam, 3 to 8 percent slopes--	92	IIwe-2	9	1	18	9	44
WxC	Woodbridge fine sandy loam, 8 to 15 percent slopes-	92	IIIew-2	11	1	18	9	44
WyA	Woodbridge stony fine sandy loam, 0 to 3 percent slopes--	92	IVws-2	12	1	18	9	44
WyB	Woodbridge stony fine sandy loam, 3 to 8 percent slopes--	92	IVws-2	12	1	18	9	44
WyC	Woodbridge stony fine sandy loam, 8 to 15 percent slopes--	92	IVws-2	12	1	18	9	44
WzA	Woodbridge very stony fine sandy loam, 0 to 3 percent slopes-----------------------------------	92	Vs-1	12	7	20	9	44
WzC	Woodbridge very stony fine sandy loam, 3 to 15 percent slopes-----------------------------------	92	VIs-2	13	7	20	9	44

Map symbol	Mapping unit	Described on page	Capability unit Symbol	Capability unit Page	Woodland group Number	Woodland group Page	Urban group Number	Urban group Page
Ke	Kendaia-Lyons very stony silt loams	73	VIIs-4	14	5	19	11	45
Lc	Leicester fine sandy loam	74	IIIw-1	10	4	19	11	45
Le	Leicester stony fine sandy loam	74	Vws-2	12	4	19	11	45
Lg	Leicester, Ridgebury and Whitman very stony fine sandy loams	74	VIIs-4	14	5	19	11	45
Lm	Limerick silt loam	75	IIIw-2	10	4	19	13	45
Ly	Lyons silt loam	75	Vw-1	12	5	19	12	45
Ma	Made land	75	------	---	11	21	---	---
MyA	Merrimac sandy loam, 0 to 3 percent slopes	76	IIs-1	9	6	20	1	41
MyB	Merrimac sandy loam, 3 to 8 percent slopes	76	IIs-2	9	6	20	1	41
MyC	Merrimac sandy loam, 8 to 15 percent slopes	76	IIIe-3	10	6	20	2	41
On	Ondawa fine sandy loam	77	IIw-4	8	2	18	13	45
PbA	Paxton fine sandy loam, 0 to 3 percent slopes	78	I-2	7	2	18	5	42
PbB	Paxton fine sandy loam, 3 to 8 percent slopes	78	IIe-2	7	2	18	5	42
PbB2	Paxton fine sandy loam, 3 to 8 percent slopes, eroded	78	IIe-2	7	2	18	5	42
PbC	Paxton fine sandy loam, 8 to 15 percent slopes	78	IIIe-2	9	2	18	6	43
PbC2	Paxton fine sandy loam, 8 to 15 percent slopes, eroded	78	IIIe-2	9	2	18	6	43
PbD	Paxton fine sandy loam, 15 to 25 percent slopes	79	IVe-2	11	3	19	7	43
PbD2	Paxton fine sandy loam, 15 to 25 percent slopes, eroded	79	IVe-2	11	3	19	7	43
PbE	Paxton fine sandy loam, 25 to 35 percent slopes	79	VIe-2	12	3	19	7	43
PdB	Paxton stony fine sandy loam, 3 to 8 percent slopes	79	IVes-2	11	2	18	5	42
PdC	Paxton stony fine sandy loam, 8 to 15 percent slopes	79	IVes-2	11	2	18	6	43
PdD	Paxton stony fine sandy loam, 15 to 25 percent slopes	79	VIes-2	13	3	19	7	43
PeA	Paxton very stony fine sandy loam, 0 to 3 percent slopes	79	Vs-1	12	7	20	6	43
PeC	Paxton very stony fine sandy loam, 3 to 15 percent slopes	79	VIs-2	13	7	20	6	43
PeD	Paxton very stony fine sandy loam, 15 to 35 percent slopes	79	VIIs-2	14	8	20	7	43
Pk	Peat and Muck	79	VIIw-1	14	11	21	12	45
Pm	Muck, shallow	77	VIw-1	13	5	19	12	45
Po	Podunk fine sandy loam	80	IIw-5	8	1	18	13	45
Rc	Raynham silt loam	81	IIIw-1	10	4	19	11	45
Rd	Ridgebury fine sandy loam	81	IIIw-1	10	4	19	11	45
Re	Riverwash	81	VIIIs-1	14	11	21	13	45
Rg	Ridgebury stony fine sandy loam	81	Vws-2	12	4	19	11	45
Rh	Rock land	82	VIIIs-1	14	11	21	10	44
Ru	Rumney fine sandy loam	82	IIIw-2	10	4	19	13	45
Sb	Saco silt loam	83	VIw-1	13	5	19	13	45
Sf	Scarboro loamy fine sand	83	Vw-1	12	5	19	12	45
SkC	Shapleigh very rocky sandy loam, 3 to 15 percent slopes	84	VIs-3	13	9	20	10	44
SkE	Shapleigh very rocky sandy loam, 15 to 35 percent slopes	84	VIIs-3	14	10	21	10	44
SmC	Shapleigh extremely rocky sandy loam, 3 to 15 percent slopes	84	VIIs-3	14	9	20	10	44
SmE	Shapleigh extremely rocky sandy loam, 15 to 35 percent slopes	84	VIIs-3	14	10	21	10	44
SnA	Stockbridge loam, 0 to 3 percent slopes	84	I-2	7	2	18	5	42
SnB	Stockbridge loam, 3 to 8 percent slopes	85	IIe-2	7	2	18	5	42
SnB2	Stockbridge loam, 3 to 8 percent slopes, eroded	85	IIe-2	7	2	18	5	42
SnC	Stockbridge loam, 8 to 15 percent slopes	85	IIIe-2	9	2	18	6	43
SnC2	Stockbridge loam, 8 to 15 percent slopes, eroded	85	IIIe-2	9	2	18	6	43
SnD2	Stockbridge loam, 15 to 25 percent slopes, eroded	85	IVe-2	11	3	19	7	43
SpB	Stockbridge stony loam, 3 to 8 percent slopes	85	IVes-2	11	2	18	5	42

Map symbol	Mapping unit	Described on page	Capability unit Symbol	Capability unit Page	Woodland group Number	Woodland group Page	Urban group Number	Urban group Page
DoA	Dover fine sandy loam, 0 to 3 percent slopes	61	I-1	7	2	18	3	42
DoB	Dover fine sandy loam, 3 to 8 percent slopes	61	IIe-1	7	2	18	3	42
DoC	Dover fine sandy loam, 8 to 15 percent slopes	61	IIIe-1	9	2	18	4	42
DoD	Dover fine sandy loam, 15 to 25 percent slopes	61	IVe-1	11	3	19	7	43
DvB	Dover stony fine sandy loam, 3 to 8 percent slopes	61	IVes-1	11	2	18	3	42
DvC	Dover stony fine sandy loam, 8 to 15 percent slopes	61	IVes-1	11	2	18	4	42
Ee	Eel silt loam	62	IIw-5	8	1	18	13	45
EsA	Enfield silt loam, 0 to 3 percent slopes	62	I-1	7	2	18	1	41
EsB	Enfield silt loam, 3 to 8 percent slopes	63	IIe-1	7	2	18	1	41
EsC	Enfield silt loam, 8 to 15 percent slopes	63	IIIe-1	9	2	18	2	41
FaC	Farmington very rocky silt loam, 3 to 15 percent slopes	63	VIs-3	13	9	20	10	44
FaE	Farmington very rocky silt loam, 15 to 35 percent slopes	63	VIIs-3	14	10	21	10	44
FmC	Farmington extremely rocky silt loam, 3 to 15 percent slopes	63	VIIs-3	14	9	20	10	44
FmE	Farmington extremely rocky silt loam, 15 to 35 percent slopes	63	VIIs-3	14	10	21	10	44
Fr	Fredon silt loam	64	IIIw-1	10	4	19	11	45
GaB	Gloucester sandy loam, 3 to 8 percent slopes	66	IIs-2	9	6	20	3	42
GaC	Gloucester sandy loam, 8 to 15 percent slopes	66	IIIe-3	10	6	20	4	42
GaD	Gloucester sandy loam, 15 to 25 percent slopes	66	IVe-1	11	3	19	7	43
GbB	Gloucester stony sandy loam, 3 to 8 percent slopes	66	IVes-1	11	6	20	3	42
GbC	Gloucester stony sandy loam, 8 to 15 percent slopes	66	IVes-1	11	6	20	4	42
GbD	Gloucester stony sandy loam, 15 to 25 percent slopes	66	VIes-1	13	3	19	7	43
GeC	Gloucester very stony sandy loam, 3 to 15 percent slopes	66	VIs-1	13	7	20	4	42
GeE	Gloucester very stony sandy loam, 15 to 35 percent slopes	66	VIIs-1	14	8	20	7	43
Gf	Genesee silt loam	64	IIw-4	8	2	18	13	45
Gn	Granby loamy fine sand	67	Vw-1	12	5	19	12	45
GrA	Groton gravelly sandy loam, 0 to 3 percent slopes	67	IIIs-2	10	6	20	1	41
GrC	Groton gravelly sandy loam, 3 to 15 percent slopes	67	IIIse-1	10	6	20	1	41
HbA	Hartland silt loam, 0 to 3 percent slopes	68	I-1	7	2	18	1	41
HbB	Hartland silt loam, 3 to 8 percent slopes	68	IIe-1	7	2	18	1	41
HbC	Hartland silt loam, 8 to 15 percent slopes	68	IIIe-1	9	2	18	2	41
HeA	Hero loam, 0 to 3 percent slopes	69	IIw-1	8	1	18	8	43
HeB	Hero loam, 3 to 8 percent slopes	69	IIwe-1	8	1	18	8	43
HkA	Hinckley gravelly sandy loam, 0 to 3 percent slopes	70	IIIs-2	10	6	20	1	41
HkC	Hinckley gravelly sandy loam, 3 to 15 percent slopes	70	IIIse-1	10	6	20	1	41
HmA	Hinckley gravelly loamy sand, 0 to 3 percent slopes	70	IIIs-1	10	6	20	1	41
HmC	Hinckley gravelly loamy sand, 3 to 15 percent slopes	70	IVse-1	11	6	20	1	41
HoC	Hollis rocky fine sandy loam, 3 to 15 percent slopes	70	VIs-3	13	9	20	10	44
HrC	Hollis very rocky fine sandy loam, 3 to 15 percent slopes	71	VIs-3	13	9	20	10	44
HrE	Hollis very rocky fine sandy loam, 15 to 35 percent slopes	71	VIIs-3	14	10	21	10	44
HxC	Hollis extremely rocky fine sandy loam, 3 to 15 percent slopes	72	VIIs-3	14	9	20	10	44
HxE	Hollis extremely rocky fine sandy loam, 15 to 35 percent slopes	72	VIIs-3	14	10	21	10	44
HyC	Holyoke very rocky silt loam, 3 to 15 percent slopes	72	VIs-3	13	9	20	10	44
HzE	Holyoke extremely rocky silt loam, 15 to 35 percent slopes	72	VIIs-3	14	10	21	10	44
Ka	Kendaia silt loam	73	IIIw-1	10	4	19	11	45

GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and the soil series to which the mapping unit belongs. See discussion beginning on p. 5 for basic practices of management that are needed on all soils used for cultivated crops and pasture. Other information is given in tables as follows:

Estimated yields, table 1, p. 15.
Engineering uses of the soils, tables 2, 3, and 4, pp. 22 through 37.
Use of soils for wildlife, table 5, p. 47.
Acreage and extent, table 6, p. 50.

Map symbol	Mapping unit	Described on page	Capability unit		Woodland group		Urban group	
			Symbol	Page	Number	Page	Number	Page
Am	Alluvial land	51	IIIw-2	10	4	19	13	45
AnA	Amenia silt loam, 0 to 3 percent slopes	52	IIw-2	8	1	18	9	44
AnB	Amenia silt loam, 3 to 8 percent slopes	52	IIwe-2	9	1	18	9	44
AnC	Amenia silt loam, 8 to 15 percent slopes	52	IIIew-2	11	1	18	9	44
AoB	Amenia stony silt loam, 3 to 8 percent slopes	52	IVws-2	12	1	18	9	44
AoC	Amenia stony silt loam, 8 to 15 percent slopes	53	IVws-2	12	1	18	9	44
ApC	Amenia very stony silt loam, 3 to 15 percent slopes	53	VIs-2	13	7	20	9	44
Au	Au Gres loamy fine sand	53	IIIw-1	10	4	19	11	45
BaA	Belgrade silt loam, 0 to 3 percent slopes	54	IIw-1	8	1	18	8	43
BaB	Belgrade silt loam, 3 to 8 percent slopes	54	IIwe-1	8	1	18	8	43
Bk	Borrow and fill land, coarse material	56	------	---	11	21	---	---
Bl	Borrow and fill land, loamy material	56	------	---	11	21	---	---
BoB	Branford loam, 3 to 8 percent slopes	57	IIe-1	7	2	18	1	41
BoC	Branford loam, 8 to 15 percent slopes	57	IIIe-1	9	2	18	2	41
BqB	Bernardston silt loam, 3 to 8 percent slopes	55	IIe-2	7	2	18	5	42
BqC	Bernardston silt loam, 8 to 15 percent slopes	55	IIIe-2	9	2	18	6	43
BuB	Bernardston stony silt loam, 3 to 8 percent slopes	55	IVes-2	11	2	18	5	42
BuC	Bernardston stony silt loam, 8 to 15 percent slopes	55	IVes-2	11	2	18	6	43
BwC	Bernardston very stony silt loam, 3 to 15 percent slopes	55	VIs-2	13	7	20	6	43
BwD	Bernardston very stony silt loam, 15 to 25 percent slopes	55	VIIs-2	14	8	20	7	43
Bz	Birdsall silt loam	56	Vw-1	12	5	19	12	45
CaA	Charlton fine sandy loam, 0 to 3 percent slopes	57	I-1	7	2	18	3	42
CaB	Charlton fine sandy loam, 3 to 8 percent slopes	58	IIe-1	7	2	18	3	42
CaB2	Charlton fine sandy loam, 3 to 8 percent slopes, eroded	58	IIe-1	7	2	18	3	42
CaC	Charlton fine sandy loam, 8 to 15 percent slopes	58	IIIe-1	9	2	18	4	42
CaC2	Charlton fine sandy loam, 8 to 15 percent slopes, eroded	58	IIIe-1	9	2	18	4	42
CaD	Charlton fine sandy loam, 15 to 25 percent slopes	58	IVe-1	11	3	19	7	43
CaE	Charlton fine sandy loam, 25 to 35 percent slopes	58	VIe-1	12	3	19	7	43
ChB	Charlton stony fine sandy loam, 3 to 8 percent slopes	58	IVes-1	11	2	18	3	42
ChC	Charlton stony fine sandy loam, 8 to 15 percent slopes	58	IVes-1	11	2	18	4	42
ChD	Charlton stony fine sandy loam, 15 to 25 percent slopes	59	VIes-1	13	3	19	7	43
CrC	Charlton very stony fine sandy loam, 3 to 15 percent slopes	59	VIs-1	13	7	20	4	42
CrD	Charlton very stony fine sandy loam, 15 to 35 percent slopes	59	VIIs-1	14	8	20	7	43
CwA	Copake loam, 0 to 3 percent slopes	59	I-1	7	2	18	1	41
CwB	Copake loam, 3 to 8 percent slopes	59	IIe-1	7	2	18	1	41
CwC	Copake loam, 8 to 15 percent slopes	59	IIIe-1	9	2	18	2	41
DeA	Deerfield loamy fine sand, 0 to 3 percent slopes	60	IIs-1	9	6	20	8	43

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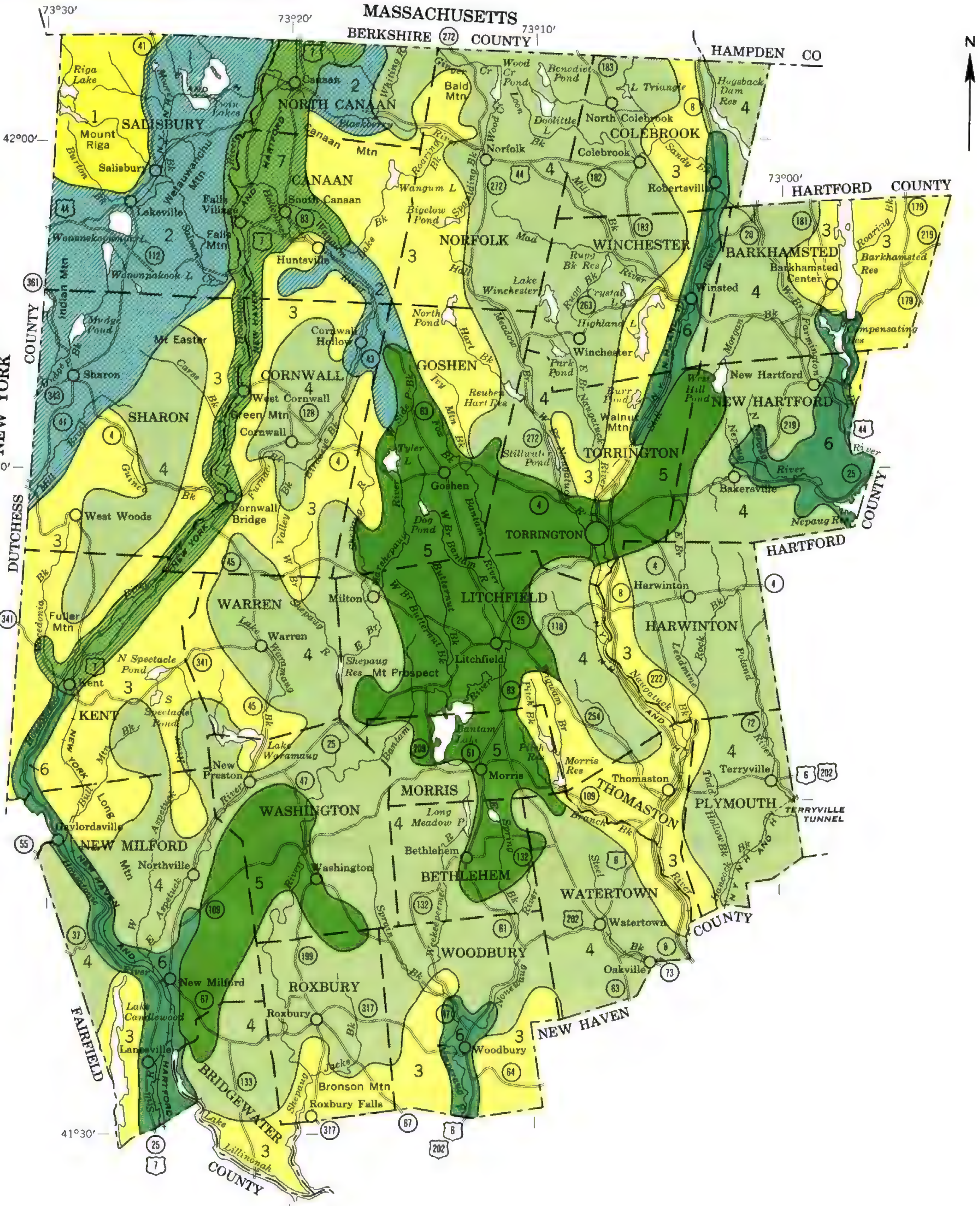


SOIL ASSOCIATIONS

1 — Hollis-Bernardston association: Gently sloping to steep, well-drained or somewhat excessively drained, rocky soils that are shallow to bedrock and deep, well-drained soils that have a fragipan; on uplands

2 — Stockbridge-Farmington-Amenia association: Mostly gently sloping to steep, well drained and moderately well drained, deep soils that formed in glacial till and somewhat excessively drained, rocky soils that are shallow to bedrock; on uplands in the limestone valley

3 — Hollis-Charlton association: Gently sloping to steep, somewhat excessively drained or well-drained, rocky soils that are shallow to bedrock and deep, well-drained soils that formed in glacial till; on uplands

4 — Charlton-Paxton-Hollis association: Gently sloping to steep, well-drained, deep soils that formed in glacial till and somewhat excessively drained or well-drained, rocky soils that are shallow to bedrock; on uplands

5 — Paxton-Woodbridge association: Gently sloping to steep, well-drained and moderately well drained soils that formed in glacial till and have a fragipan; on uplands

6 — Hinckley-Merrimac-Hartland association: Mostly nearly level to gently sloping or undulating, excessively drained to well-drained soils on terraces

7 — Copake-Groton-Genesee association: Mostly nearly level to gently sloping or undulating, well-drained and excessively drained soils on terraces and nearly level, well-drained soils on flood plains in the limestone valley

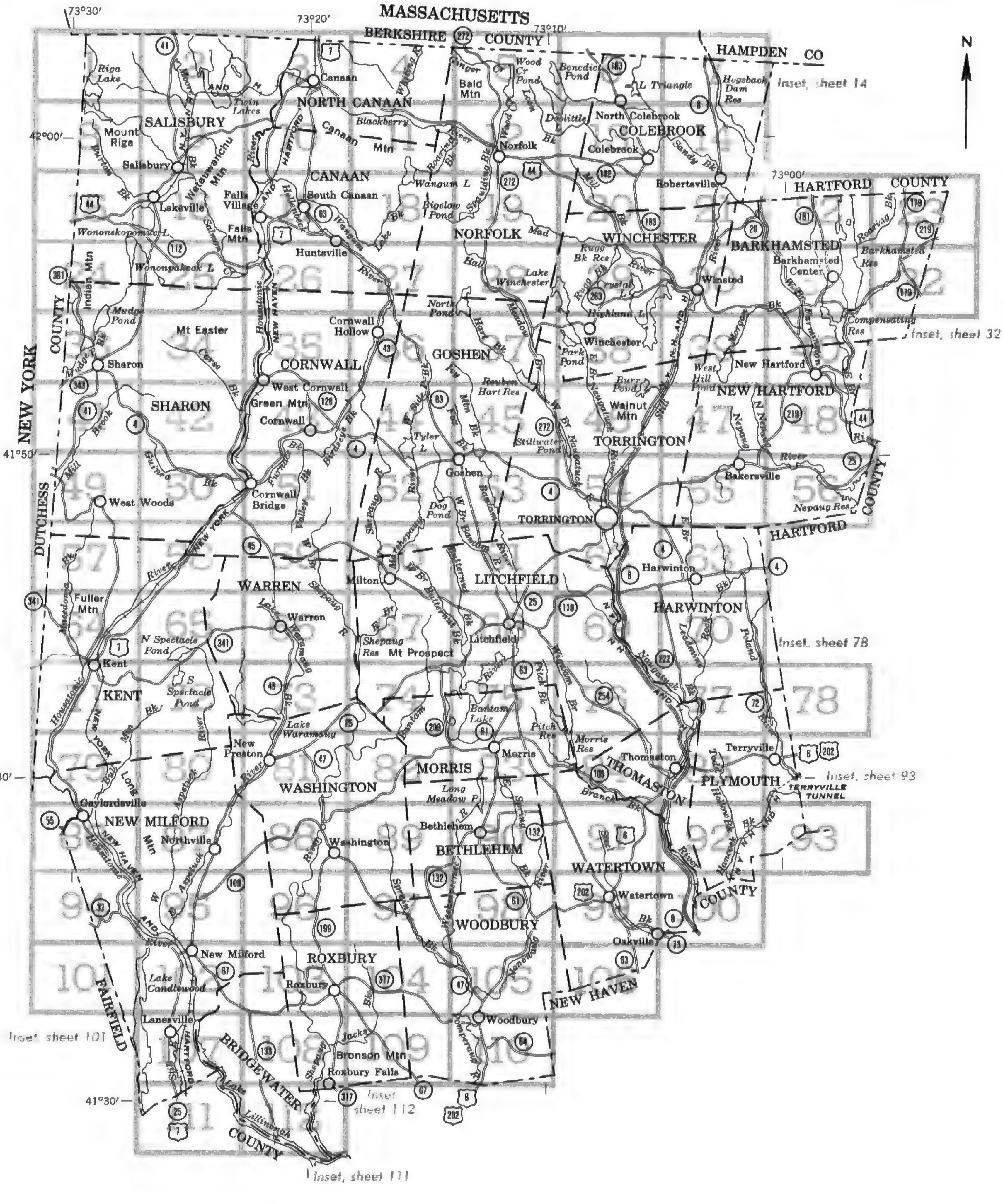
March 1969

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
CONNECTICUT AGRICULTURAL EXPERIMENT STATION,
AND THE STORRS AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP
LITCHFIELD COUNTY, CONNECTICUT

Scale 1:253 440

1 0 1 2 3 4 Miles



Original text from each map sheet:
“This map is one of a set compiled in 1968
as part of a soil survey by the Soil Conservation Service,
United States Department of Agriculture, and the
Connecticut Agricultural Experiment Station, and the Storrs
Agricultural Experiment Station.”

INDEX TO MAP SHEETS
LITCHFIELD COUNTY, CONNECTICUT

Scale 1:253 440
1 0 1 2 3 4 Miles

SOIL LEGEND

The first capital letter in each symbol is the initial one of the soil name. The second capital letter, A, B, C, D, or E, if used, shows the slope. Some symbols which contain no slope letter are for nearly level soils or land types; some are for soils or land types that have considerable range in slope. A final number, 2, in a symbol shows that the soil is eroded.

SYMBOL	NAME
Am	Alluvial land
AnA	Amenia silt loam, 0 to 3 percent slopes
AnB	Amenia silt loam, 3 to 8 percent slopes
AnC	Amenia silt loam, 8 to 15 percent slopes
AoB	Amenia stony silt loam, 3 to 8 percent slopes
AoC	Amenia stony silt loam, 8 to 15 percent slopes
ApC	Amenia very stony silt loam, 3 to 15 percent slopes
Au	Au Gres loamy fine sand
BaA	Belgrade silt loam, 0 to 3 percent slopes
BaB	Belgrade silt loam, 3 to 8 percent slopes
Bk	Borrow and fill land, coarse material
Bl	Borrow and fill land, loamy material
BoB	Branford loam, 3 to 8 percent slopes
BoC	Branford loam, 8 to 15 percent slopes
BqB	Bernardston silt loam, 3 to 8 percent slopes
BqC	Bernardston silt loam, 8 to 15 percent slopes
BuB	Bernardston stony silt loam, 3 to 8 percent slopes
BuC	Bernardston stony silt loam, 8 to 15 percent slopes
BwC	Bernardston very stony silt loam, 3 to 15 percent slopes
BwD	Bernardston very stony silt loam, 15 to 25 percent slopes
Bz	Birdsall silt loam
CaA	Charlton fine sandy loam, 0 to 3 percent slopes
CaB	Charlton fine sandy loam, 3 to 8 percent slopes
CaB2	Charlton fine sandy loam, 3 to 8 percent slopes, eroded
CaC	Charlton fine sandy loam, 8 to 15 percent slopes
CaC2	Charlton fine sandy loam, 8 to 15 percent slopes, eroded
CaD	Charlton fine sandy loam, 15 to 25 percent slopes
CaE	Charlton fine sandy loam, 25 to 35 percent slopes
ChB	Charlton stony fine sandy loam, 3 to 8 percent slopes
ChC	Charlton stony fine sandy loam, 8 to 15 percent slopes
ChD	Charlton stony fine sandy loam, 15 to 25 percent slopes
CrC	Charlton very stony fine sandy loam, 3 to 15 percent slopes
CrD	Charlton very stony fine sandy loam, 15 to 35 percent slopes
CwA	Copake loam, 0 to 3 percent slopes
CwB	Copake loam, 3 to 8 percent slopes
CwC	Copake loam, 8 to 15 percent slopes
DeA	Deerfield loamy fine sand, 0 to 3 percent slopes
DoA	Dover fine sandy loam, 0 to 3 percent slopes
DoB	Dover fine sandy loam, 3 to 8 percent slopes
DoC	Dover fine sandy loam, 8 to 15 percent slopes
DoD	Dover fine sandy loam, 15 to 25 percent slopes
DvB	Dover stony fine sandy loam, 3 to 8 percent slopes
DvC	Dover stony fine sandy loam, 8 to 15 percent slopes
Ee	Eel silt loam
EsA	Enfield silt loam, 0 to 3 percent slopes
EsB	Enfield silt loam, 3 to 8 percent slopes
EsC	Enfield silt loam, 8 to 15 percent slopes
FaC	Farmington very rocky silt loam, 3 to 15 percent slopes
FaE	Farmington very rocky silt loam, 15 to 35 percent slopes
FmC	Farmington extremely rocky silt loam, 3 to 15 percent slopes
FmE	Farmington extremely rocky silt loam, 15 to 35 percent slopes
Fr	Fredon silt loam

SYMBOL	NAME
GaB	Gloucester sandy loam, 3 to 8 percent slopes
GaC	Gloucester sandy loam, 8 to 15 percent slopes
GaD	Gloucester sandy loam, 15 to 25 percent slopes
GbB	Gloucester stony sandy loam, 3 to 8 percent slopes
GbC	Gloucester stony sandy loam, 8 to 15 percent slopes
GbD	Gloucester stony sandy loam, 15 to 25 percent slopes
GeC	Gloucester very stony sandy loam, 3 to 15 percent slopes
GeE	Gloucester very stony sandy loam, 15 to 35 percent slopes
Gf	Genesee silt loam
Gn	Granby loamy fine sand
GrA	Groton gravelly sandy loam, 0 to 3 percent slopes
GrC	Groton gravelly sandy loam, 3 to 15 percent slopes
HbA	Hartland silt loam, 0 to 3 percent slopes
HbB	Hartland silt loam, 3 to 8 percent slopes
HbC	Hartland silt loam, 8 to 15 percent slopes
HeA	Hero loam, 0 to 3 percent slopes
HeB	Hero loam, 3 to 8 percent slopes
HkA	Hinckley gravelly sandy loam, 0 to 3 percent slopes
HkC	Hinckley gravelly sandy loam, 3 to 15 percent slopes
HmA	Hinckley gravelly loamy sand, 0 to 3 percent slopes
HmC	Hinckley gravelly loamy sand, 3 to 15 percent slopes
HoC	Hollis rocky fine sandy loam, 3 to 15 percent slopes
HrC	Hollis very rocky fine sandy loam, 3 to 15 percent slopes
HrE	Hollis very rocky fine sandy loam, 15 to 35 percent slopes
HxC	Hollis extremely rocky fine sandy loam, 3 to 15 percent slopes
HxE	Hollis extremely rocky fine sandy loam, 15 to 35 percent slopes
HyC	Holyoke very rocky silt loam, 3 to 15 percent slopes
HzE	Holyoke extremely rocky silt loam, 15 to 35 percent slopes
Ka	Kendaia silt loam
Ke	Kendaia-Lyons very stony silt looms
Lc	Leicester fine sandy loam
Le	Leicester stony fine sandy loam
Lg	Leicester, Ridgebury and Whitman very stony fine sandy loams
Lm	Limerick silt loam
Ly	Lyons silt loam
Ma	Made land
MyA	Merrimac sandy loam, 0 to 3 percent slopes
MyB	Merrimac sandy loam, 3 to 8 percent slopes
MyC	Merrimac sandy loam, 8 to 15 percent slopes
On	Ondawa fine sandy loam
PbA	Paxton fine sandy loam, 0 to 3 percent slopes
PbB	Paxton fine sandy loam, 3 to 8 percent slopes
PbB2	Paxton fine sandy loam, 3 to 8 percent slopes, eroded
PbC	Paxton fine sandy loam, 8 to 15 percent slopes
PbC2	Paxton fine sandy loam, 8 to 15 percent slopes, eroded
PbD	Paxton fine sandy loam, 15 to 25 percent slopes
PbD2	Paxton fine sandy loam, 15 to 25 percent slopes, eroded
PbE	Paxton fine sandy loam, 25 to 35 percent slopes
PdB	Paxton stony fine sandy loam, 3 to 8 percent slopes
PdC	Paxton stony fine sandy loam, 8 to 15 percent slopes
PdD	Paxton stony fine sandy loam, 15 to 25 percent slopes

SYMBOL	NAME
PeA	Paxton very stony fine sandy loam, 0 to 3 percent slopes
PeC	Paxton very stony fine sandy loam, 3 to 15 percent slopes
PeD	Paxton very stony fine sandy loam, 15 to 35 percent slopes
Pk	Peat and Muck
Pm	Muck, shallow
Po	Podunk fine sandy loam
Rc	Raynham silt loam
Rd	Ridgebury fine sandy loam
Re	Riverwash
Rg	Ridgebury stony fine sandy loam
Rh	Rock land
Ru	Rumney fine sandy loam
Sb	Saco silt loam
Sf	Scarboro loamy fine sand
SkC	Shapleigh very rocky sandy loam, 3 to 15 percent slopes
SkE	Shapleigh very rocky sandy loam, 15 to 35 percent slopes
SmC	Shapleigh extremely rocky sandy loam, 3 to 15 percent slopes
SmE	Shapleigh extremely rocky sandy loam, 15 to 35 percent slopes
SnA	Stockbridge loam, 0 to 3 percent slopes
SnB	Stockbridge loam, 3 to 8 percent slopes
SnB2	Stockbridge loam, 3 to 8 percent slopes, eroded
SnC	Stockbridge loam, 8 to 15 percent slopes
SnC2	Stockbridge loam, 8 to 15 percent slopes, eroded
SnD2	Stockbridge loam, 15 to 25 percent slopes, eroded
SpB	Stockbridge stony loam, 3 to 8 percent slopes
SpC	Stockbridge stony loam, 8 to 15 percent slopes
SpD	Stockbridge stony loam, 15 to 25 percent slopes
SrC	Stockbridge very stony loam, 3 to 15 percent slopes
SrD	Stockbridge very stony loam, 15 to 35 percent slopes
St	Suncook loamy fine sand
SvA	Sutton fine sandy loam, 0 to 3 percent slopes
SvB	Sutton fine sandy loam, 3 to 8 percent slopes
SwA	Sutton stony fine sandy loam, 0 to 3 percent slopes
SwB	Sutton stony fine sandy loam, 3 to 8 percent slopes
SxA	Sutton very stony fine sandy loam, 0 to 3 percent slopes
SxC	Sutton very stony fine sandy loam, 3 to 15 percent slopes
Tg	Terrace escarpments
TwA	Tisbury and Sudbury soils, 0 to 3 percent slopes
TwB	Tisbury and Sudbury soils, 3 to 8 percent slopes
Wl	Walpole and Raynham soils
Wmx	Wareham loamy fine sand, nonacid variant
Wp	Whitman stony fine sandy loam
WvA	Windsor loamy fine sand, 0 to 3 percent slopes
WvB	Windsor loamy fine sand, 3 to 8 percent slopes
WvC	Windsor loamy fine sand, 8 to 15 percent slopes
WxA	Woodbridge fine sandy loam, 0 to 3 percent slopes
WxB	Woodbridge fine sandy loam, 3 to 8 percent slopes
WxC	Woodbridge fine sandy loam, 8 to 15 percent slopes
WyA	Woodbridge stony fine sandy loam, 0 to 3 percent slopes
WyB	Woodbridge stony fine sandy loam, 3 to 8 percent slopes
WyC	Woodbridge stony fine sandy loam, 8 to 15 percent slopes
WzA	Woodbridge very stony fine sandy loam, 0 to 3 percent slopes
WzC	Woodbridge very stony fine sandy loam, 3 to 15 percent slopes

Soil map constructed 1968 by Cartographic Division, Soil Conservation Service, USDA, from 1963 aerial photographs. Controlled mosaic based on Connecticut plane coordinate system, State zone, Lambert conformal conic projection, 1927 North American datum.

LITCHFIELD COUNTY, CONNECTICUT

CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Highways and roads
- Dual
- Good motor
- Poor motor
- Trail

Highway markers
- National Interstate
- U. S.
- State or county

Railroads
- Single track
- Multiple track
- Abandoned

Bridges and crossings
- Road
- Trail
- Railroad
- Ferry
- Ford
- Grade
- R. R. over
- R. R. under

Tunnel

Buildings
- School
- Church

Mine and quarry

Gravel pit

Power line

Pipeline

Cemetery

Dams

Levee

Tanks

Well, oil or gas

Forest fire or lookout station

Windmill

BOUNDARIES

- National or state
- County
- Minor civil division
- Reservation
- Land grant
- Small park, cemetery, airport

DRAINAGE

Streams, double-line
- Perennial
- Intermittent

Streams, single-line
- Perennial
- Intermittent
  - Crossable with tillage implements
  - Not crossable with tillage implements
  - Unclassified

Canals and ditches

Lakes and ponds
- Perennial
- Intermittent

Spring

Marsh or swamp

Wet spot

Alluvial fan

Drainage end

Flume

Aqueduct
- Aqueduct tunnel

RELIEF

Escarpments
- Bedrock
- Other

Prominent peak

SOIL SURVEY DATA

Soil boundary
- and symbol

Gravel

Stoniness
- Stony
- Very stony

Rock outcrops

Chert fragments

Clay spot

Sand spot

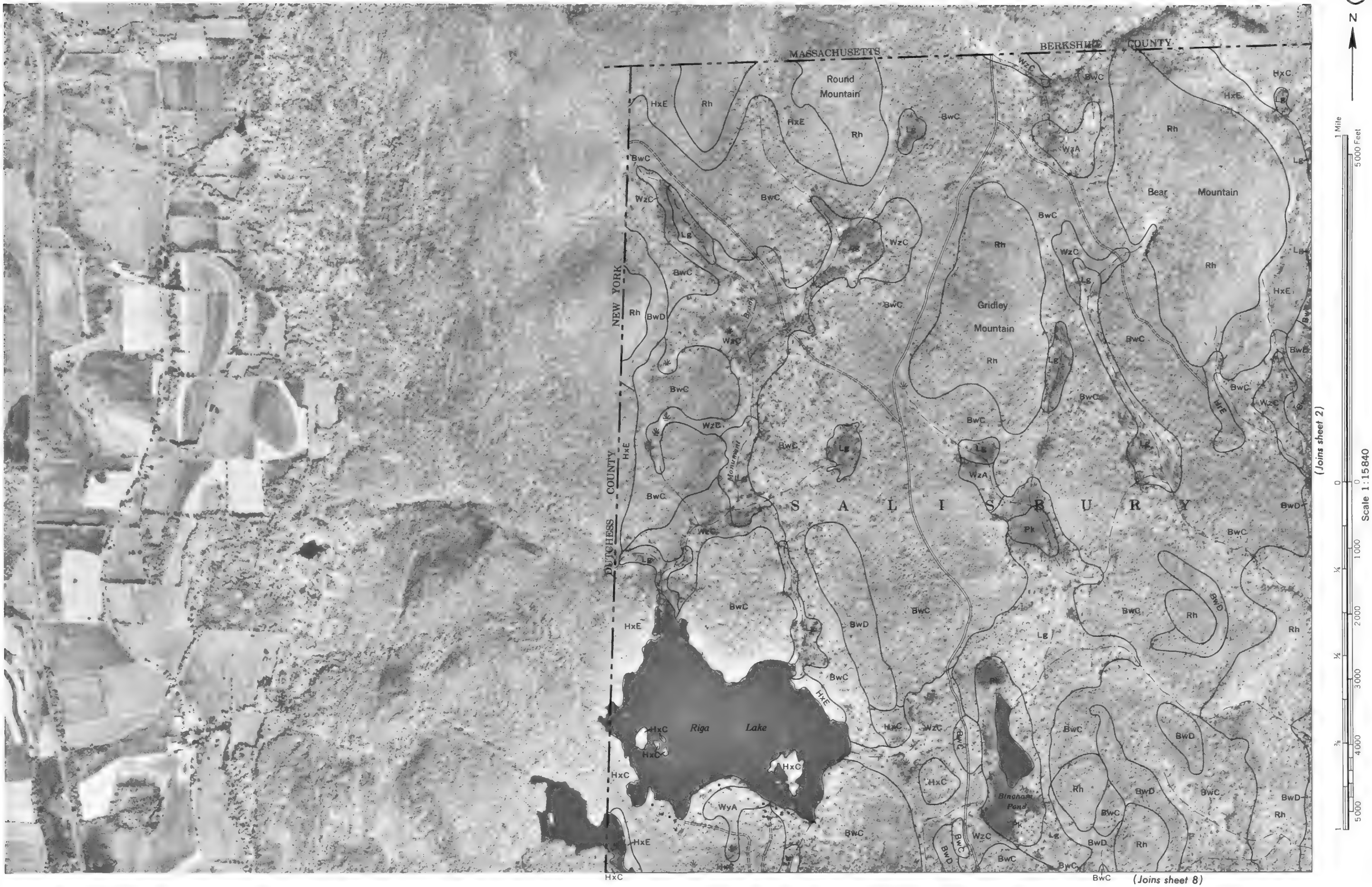
Gumbo or scabby spot

Made land

Severely eroded spot

Blowout, wind erosion

Gully


MASSACHUSETTS
BERKSHIRE COUNTY
NEW YORK
DUTCHESS COUNTY
Round Mountain
Bear Mountain
Gridley Mountain
S A L I S B U R Y
Riga Lake
Bingham Pond
(Joins sheet 2)
(Joins sheet 8)
N
Scale 1:15840
1 Mile
5000 Feet


N
1 Mile
5000 Feet
Scale 1:15840
(Joins sheet 1)
(Joins sheet 3)
(Joins sheet 9)
BERKSHIRE COUNTY
MASSACHUSETTS
Joyceville
Hammertown
Tacowic
GRAVEL PIT
Fisher Pond
SALISBURY
Washinee
Washining Lake
TWIN LAKES
Twin Lakes
Lake
NEW YORK AND NEW HAVEN AND HARTFORD
Babes Hill
Brook
41

3

N

LITCHFIELD COUNTY, CONNECTICUT NO. 3

(Joins sheet 2)

(Joins sheet 4)

Scale 1:15840

1 Mile

5000 Feet

0 1000 2000 3000 4000 5000

(Joins sheet 10)

LITCHFIELD COUNTY, CONNECTICUT NO. 4

5

N

LITCHFIELD COUNTY, CONNECTICUT NO. 5

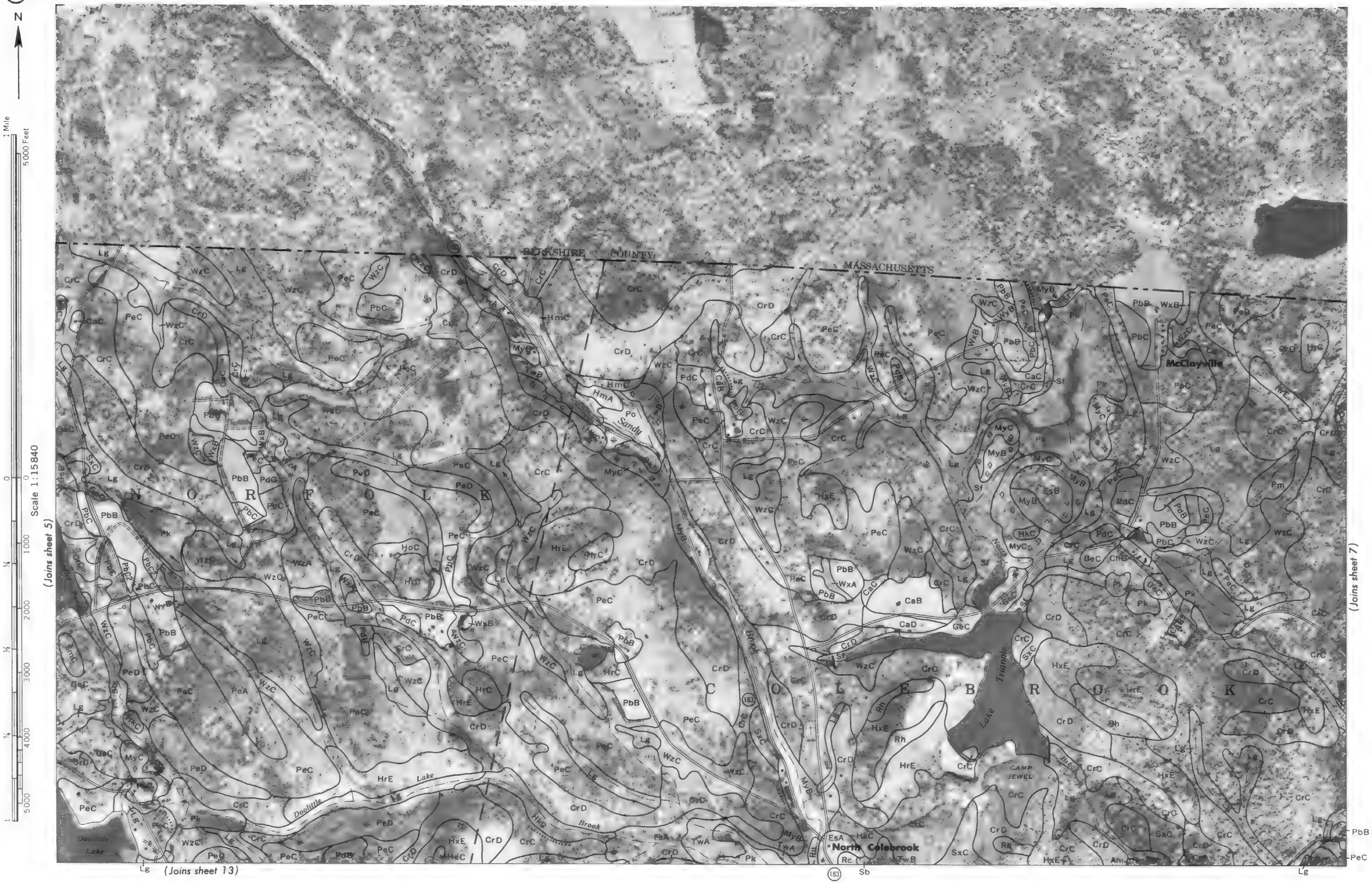
(Joins sheet 4)

PeD
Tg HrE SxC ChD SxC

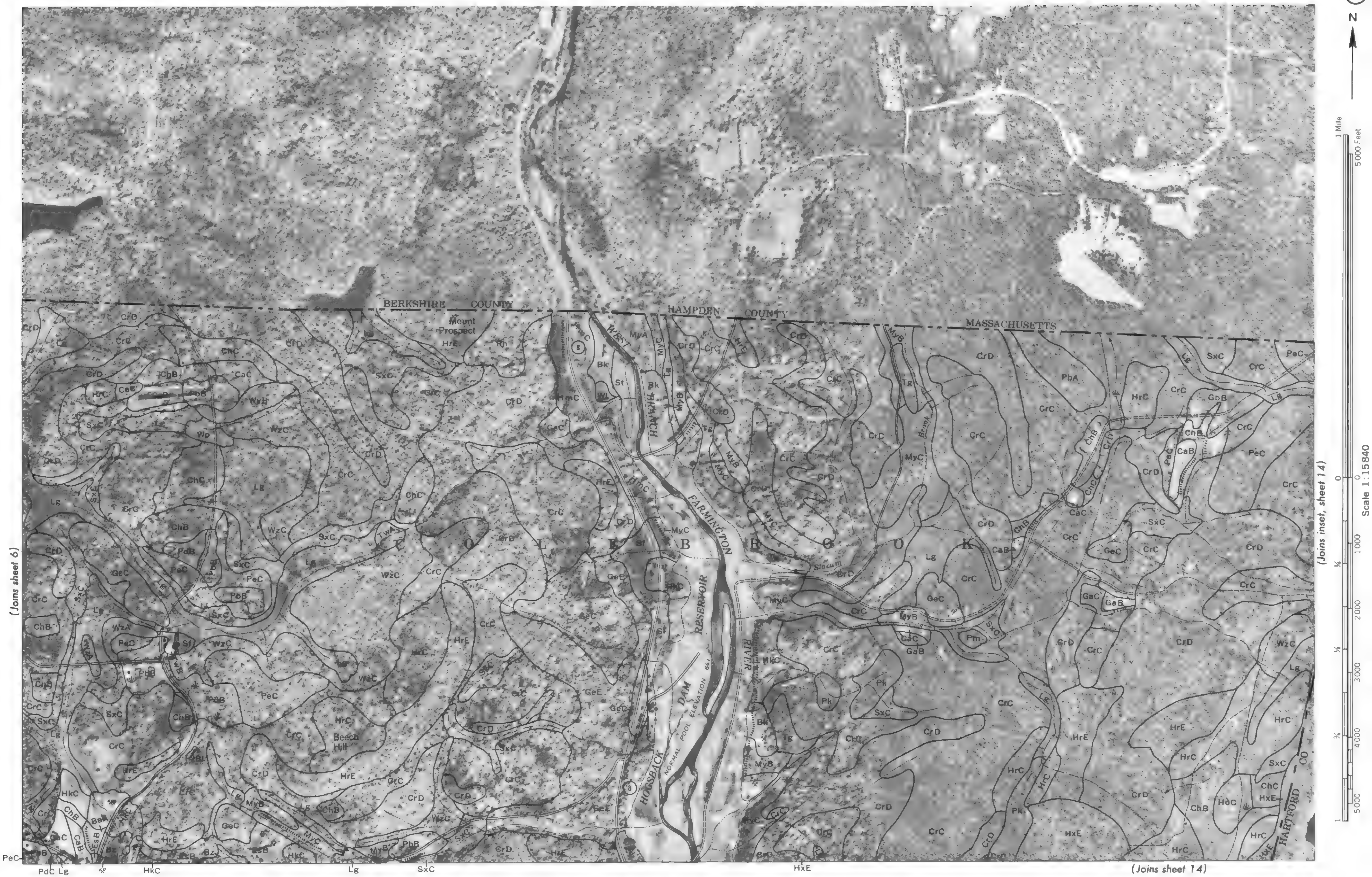
(Joins sheet 6)

(Joins sheet 12)

1 Mile
5 000 Feet
Scale 1:15 840
0 ¼ ½ ¾ 1
0 1000 2000 3000 4000 5000


N
1 Mile
5000 Feet
Scale 1:15840
(Joins sheet 5)
(Joins sheet 7)
(Joins sheet 13)
BERKSHIRE COUNTY
MASSACHUSETTS
N O R F O L K
C O L E B R O O K
McClayville
North Colebrook
Sandy
Brook
Doolittle Lake
Doolittle
Lake
Brook
Triangle
Lake
CAMP JEWEL
183

7


N
BERKSHIRE COUNTY
HAMPDEN COUNTY
MASSACHUSETTS
Mount Prospect
COLEBROOK
FARMINGTON RIVER
WEST BRANCH
HOGSBACK DAM
RESERVOIR
NORMAL POOL ELEVATION 641
Beech Hill
Slocum Brook
HARTFORD CO
(Joins sheet 6)
(Joins inset, sheet 14)
(Joins sheet 14)
Scale 1:15840
1 Mile
5000 Feet
0
1000
2000
3000
4000
5000

LITCHFIELD COUNTY, CONNECTICUT — SHEET NUMBER 8

(Joins sheet 1)

(Joins sheet 9)

(Joins sheet 15)

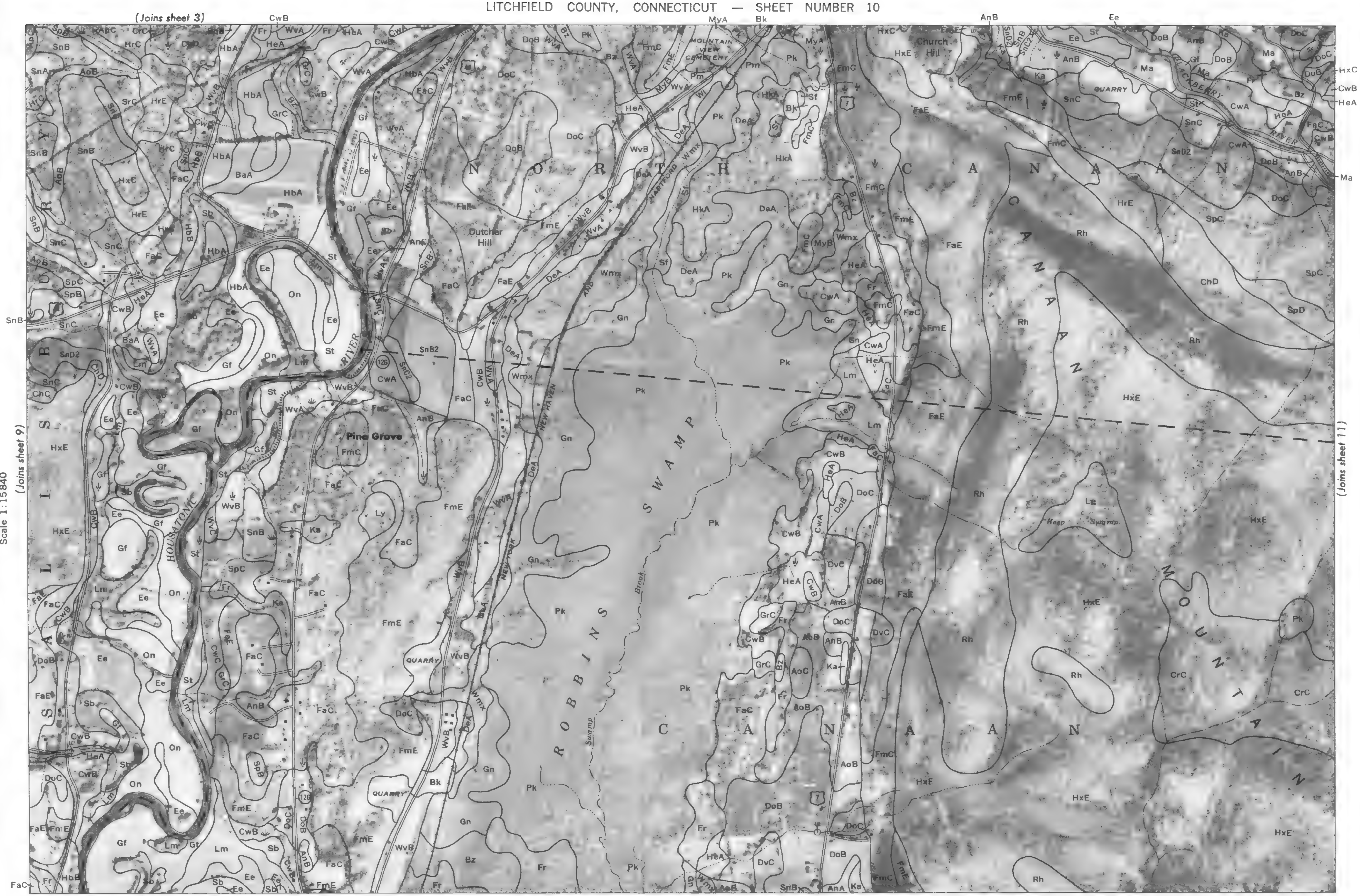

9
N
(Joins sheet 2)
(Joins sheet 8)
(Joins sheet 10)
(Joins sheet 16)
TWIN LAKES
Washinee Lake
Lions Head
Cave Hill
S A L I S B U R Y
Salisbury
CEMETERY
Wetauwanchu Mountain
Mount Prospect
Hollow
1 Mile
5000 Feet
Scale 1:15840
0
1000
2000
3000
4000
5000
¼
½
¾

N

1 Mile
5 000 Feet
Scale 1:15840
0 1000 2000 3000 4000 5000
0 ¼ ½ ¾ 1

(Joins sheet 3)

(Joins sheet 9)



(Joins sheet 11)

(Joins sheet 17)

LITCHFIELD COUNTY, CONNECTICUT NO. 10

(Joins sheet 92)

(Joins sheet 99)

(Joins lower right)

(Joins sheet 107)

(Joins sheet 94)

(Joins sheet 102)

(Joins upper left)

N

Scale 1:15840

1 Mile

5000 Feet


102
N
(Joins sheet 95)
(Joins sheet 101)
(Joins sheet 103)
(Joins sheet 107)
Scale 1:15840
1 Mile
5000 Feet
NEW MILFORD
New Milford School
Town Hill
Lynn Deming Park
Guardian Mountain
Candlewood Springs
Birch Point
Birch Groves
LAKE CANDLEWOOD
New Milford Bay
SHEPAUG RESERVOIR
HOUSATONIC RIVER
NEW HAVEN AND HARTFORD
Fort Hill
Indian Field
N E W M I L F O R D
B R I D G E W A T E R
Valley


103
N
(Joins sheet 96)
(Joins sheet 102)
(Joins sheet 104)
(Joins sheet 108)
N E W M I L F O R D
R O X B U R Y
B R I D G E W A T E R
Mine Hill
Moosehorn Hill
Greenleaf Hill
Roxbury Station
Roxbury
QUARRY
GRAVEL PIT
SHEPAUG RIVER
Scale 1:15840
1 Mile
5000 Feet

LITCHFIELD COUNTY, CONNECTICUT — SHEET NUMBER 104

105

(Joins sheet 98)

(Joins sheet 104)

(Joins sheet 106)

(Joins sheet 110)

N

1 Mile — 5000 Feet

Scale 1:15840


N
(Joins sheet 99)
(Joins sheet 105)
W A T E R T O W N
NEW HAVEN COUNTY
1 Mile
5000 Feet
Scale 1:15840

(Joins sheet 102)

(Joins inset, sheet 101)

(Joins sheet 108)

(Joins sheet 111)

LITCHFIELD COUNTY, CONNECTICUT — SHEET NUMBER 108

(Joins sheet 103)

(Joins sheet 107)

(Joins sheet 109)

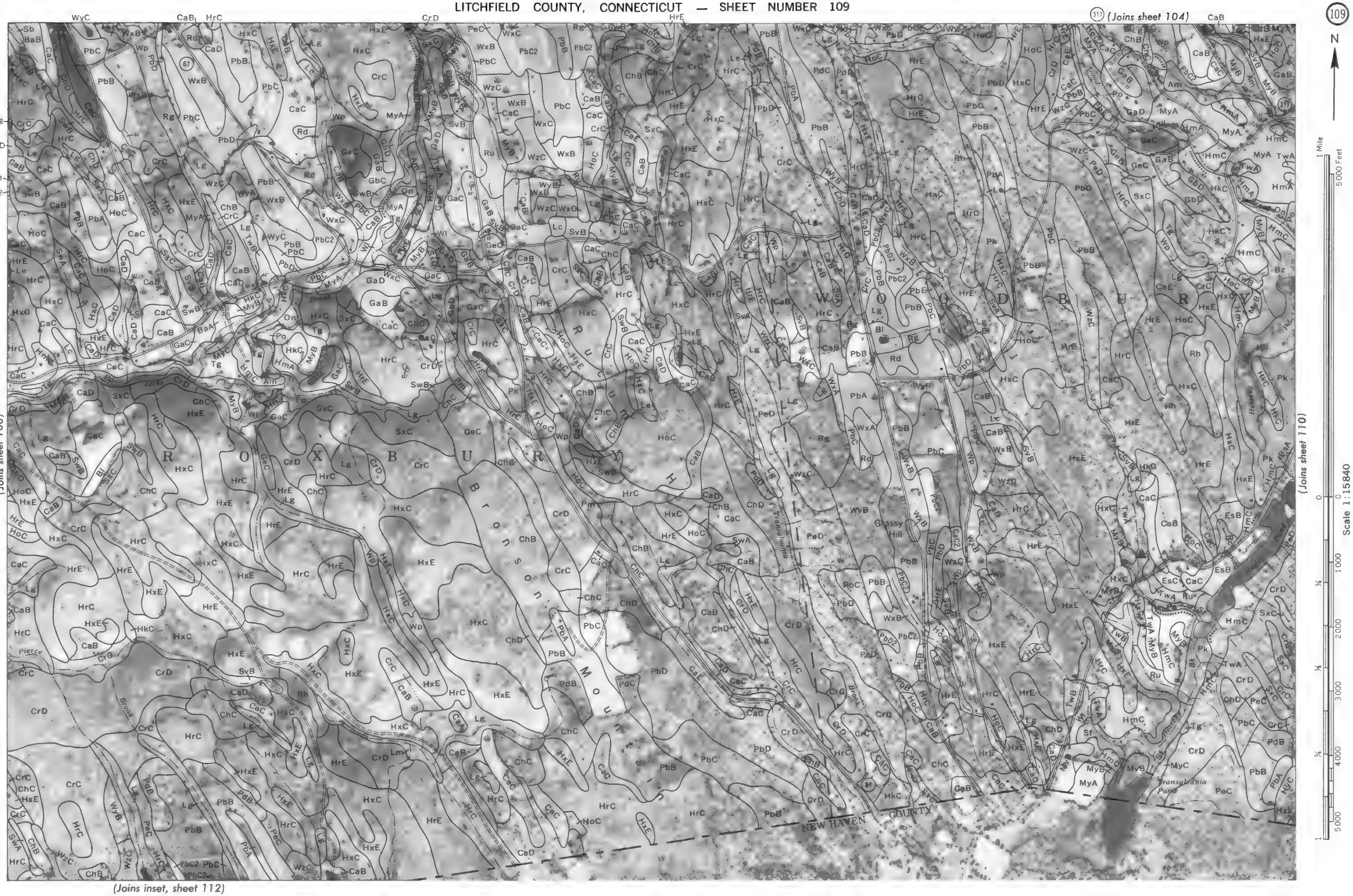
(Joins sheet 112)

N

Scale 1:15840

1 Mile

5000 Feet


(Joins sheet 104)
(Joins sheet 108)
(Joins sheet 110)
(Joins inset, sheet 112)
R O X B U R Y
W O O D B U R Y
Bronson Mountain
Grassy Hill
Transylvania Pond
NEW HAVEN COUNTY
N
1 Mile
5000 Feet
Scale 1:15840


11
(Joins sheet 4)
(Joins sheet 10)
(Joins sheet 12)
(Joins sheet 18)
LITCHFIELD COUNTY, CONNECTICUT NO. 11
N
1 Mile
5000 Feet
Scale 1:15840
0
1000
2000
3000
4000
5000
¼
½
¾
1
East Canaan
GRAVEL PIT
Whiting River
Blackberry River
NORTH CANAAN
CANAAN
CANAAN MOUNTAIN
Bradford Mountain
Wangum Lake
Roaring Brook
Brook
44

(Joins sheet 105)

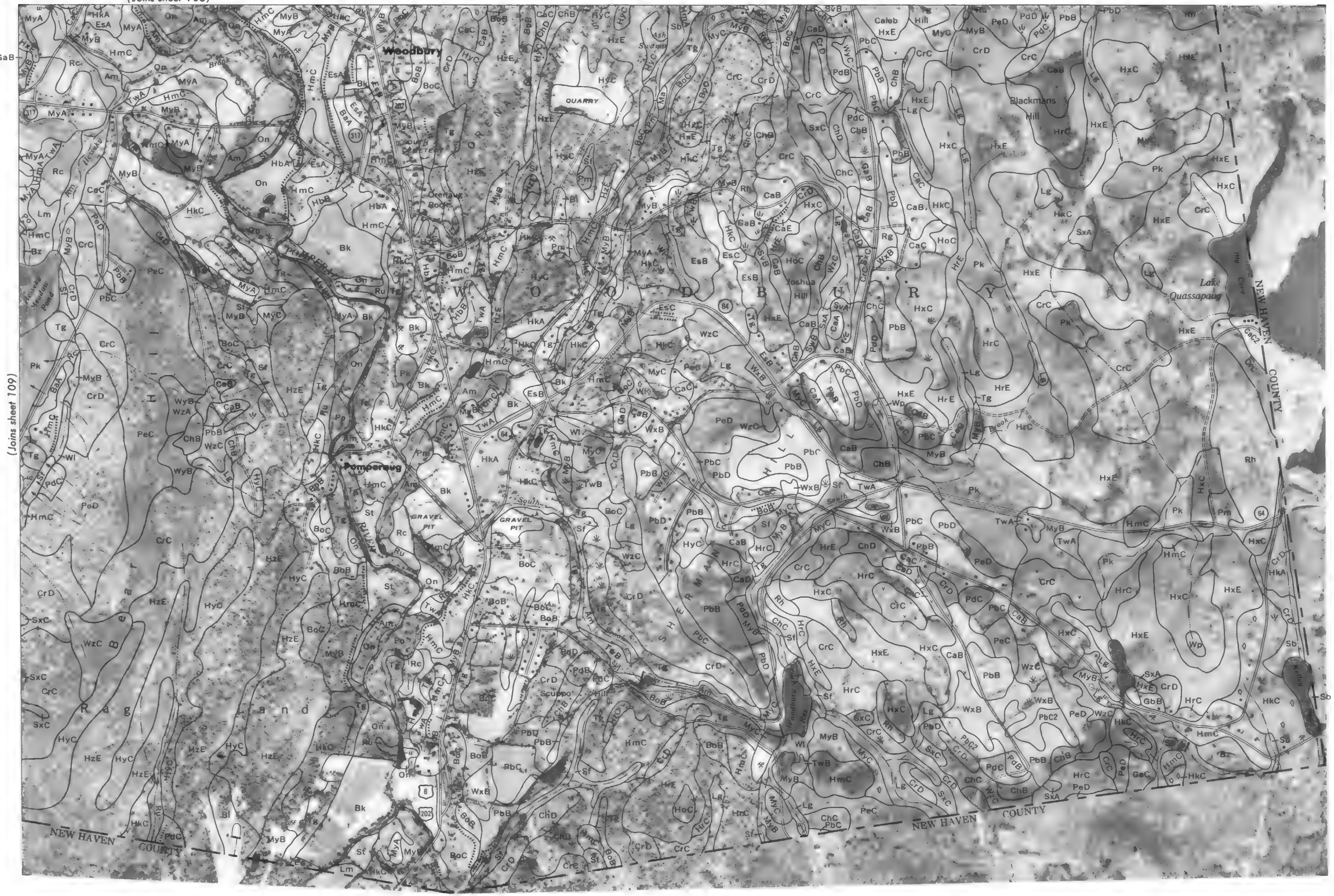
N

1 Mile

5000 Feet

Scale 1:15840

(Joins sheet 109)




(111)
N
(Joins sheet 107)
(Joins sheet 112)
(Joins sheet 112)
NEW MILFORD
BRIDGEWATER
BRIDGEWATER
CANDLEWOOD LAKE
FAIRFIELD COUNTY
FAIRFIELD COUNTY
FAIRFIELD COUNTY
FAIRFIELD COUNTY
LAKE LILLINONAH
LAKE LILLINONAH
LAKE LILLINONAH
HOUSATONIC RIVER
HOUSATONIC RIVER
SHEPAUG RIVER
STILL RIVER
NEW HAVEN CO
Chimney Point
Carmen Hill
Gallows Hill
Candlewood Lake Club
Scale 1:15840
1 Mile
5000 Feet
0
¼
½
¾
1
0
1000
2000
3000
4000
5000

LITCHFIELD COUNTY, CONNECTICUT NO. 112


N
1 Mile
5000 Feet
Scale 1:15840
0
1000
2000
3000
4000
5000
(Joins sheet 5)
(Joins sheet 11)
(Joins sheet 13)
(Joins sheet 19)
College Hill
West Norfolk
Haystack Mountain
ST MARYS CEMETERY
CENTER CEMETERY
SEWAGE DISPOSAL
Case Pond
N O R F O L K
Norfolk
Doolittle Lake
Pond Hill Pond
Brook
COUNTRY CLUB
44
182

LITCHFIELD COUNTY, CONNECTICUT NO. 13


(Joins sheet 7)
(Joins sheet 13)
(Joins sheet 21)
N
Scale 1:15840
1 Mile
5000 Feet
HOGSBACK
DAM
WEST BRANCH
NORMAL POOL ELEVATION 661
FARMINGTON RIVER
RESERVOIR
C O L E B R O O K
Eno Hill
COLEBROOK RIVER BURYING GROUND
SOUTH CEMETERY
HARTFORD COUNTY
MASSACHUSETTS
HAMPDEN COUNTY

(Joins sheet 8)

(Joins sheet 16)

(Joins sheet 24)

N

(Joins sheet 9)

(Joins sheet 15)

(Joins sheet 17)

(Joins sheet 25)

Scale 1:15840

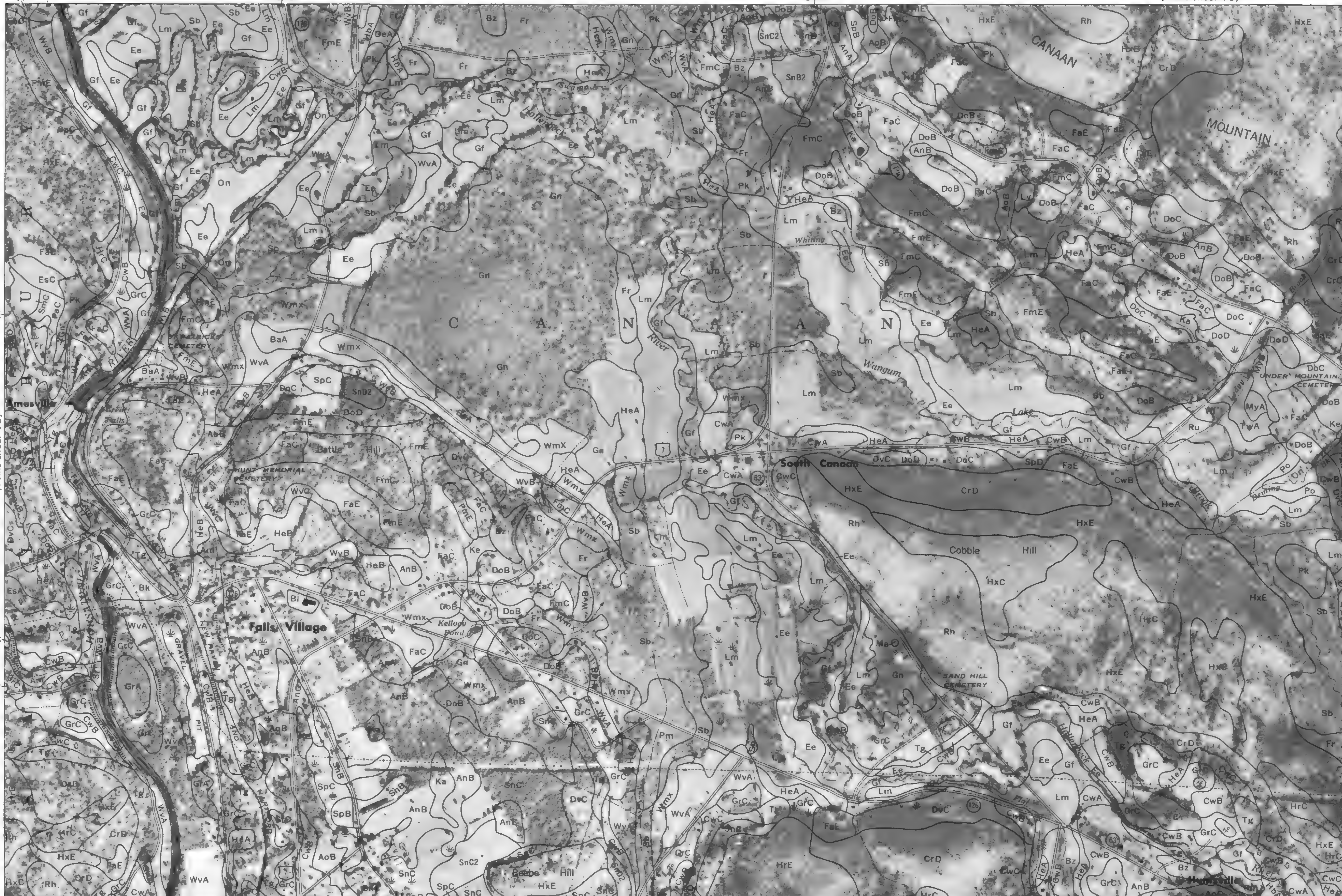
1 Mile

5000 Feet

17

N

(Joins sheet 10)



(Joins sheet 16)

(Joins sheet 18)

(Joins sheet 26)

LITCHFIELD COUNTY, CONNECTICUT NO. 17

1 Mile

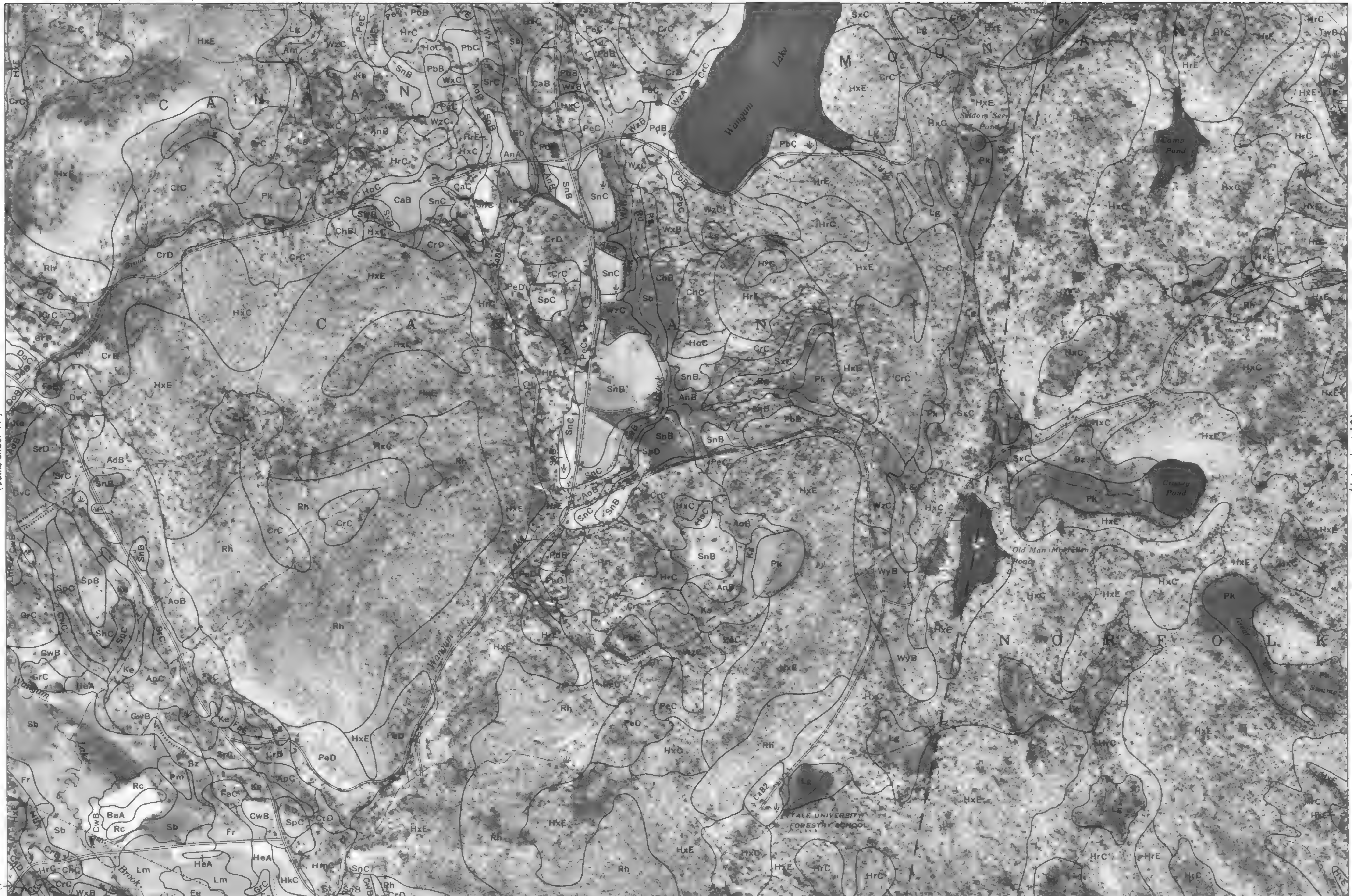
5000 Feet

Scale 1:15840

N

(Joins sheet 11)

(Joins sheet 17)



(Joins sheet 19)

(Joins sheet 27)

1 Mile

5000 Feet

Scale 1:15840

0 1000 2000 3000 4000 5000

0 ¼ ½ ¾ 1


19
N
(Joins sheet 12)
(Joins sheet 18)
(Joins sheet 20)
(Joins sheet 28)
Tobey Pond
Bigelow Pond
Childs Pond
Beckley Pond
Spaulding Pond
Smith Pond
Dolphin Pond
Great Bear Swamp
Chestnut Hill
Dutton Mountain
Pine Mountain
Dennis Hill
N O R F O L K
Spaulding
Mad River
Brook
GRANTVILLE CEMETERY
SOUTH CEMETERY
Grantville
1 Mile
5000 Feet
Scale 1:15840

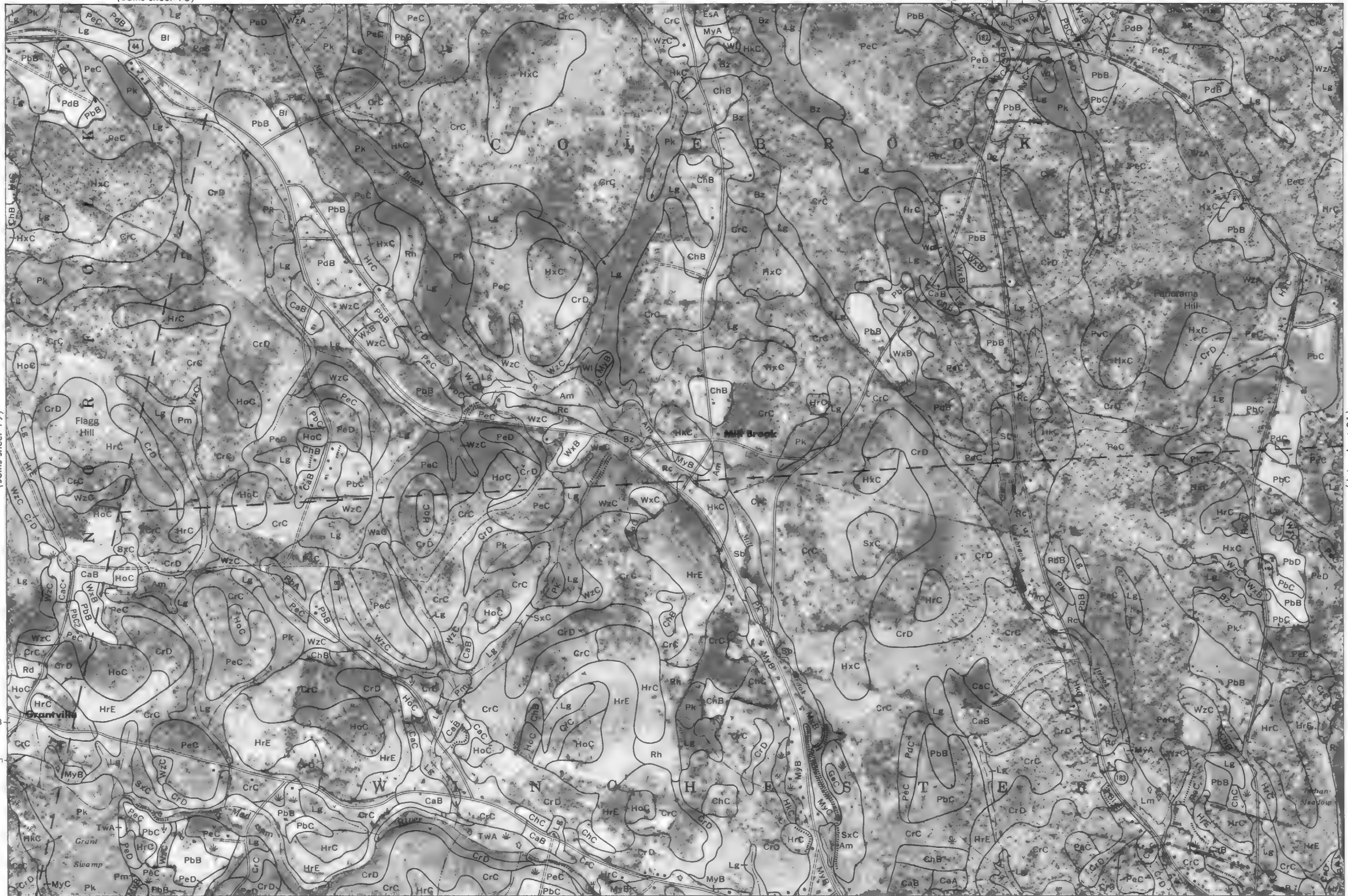
(Joins sheet 13)

N

Scale 1:15840

1 Mile
5000 Feet

(Joins sheet 19)



(Joins sheet 21)

(Joins sheet 29)

(21)

(Joins sheet 14)

(Joins sheet 20)

(Joins sheet 22)

(Joins sheet 30)

N

1 Mile

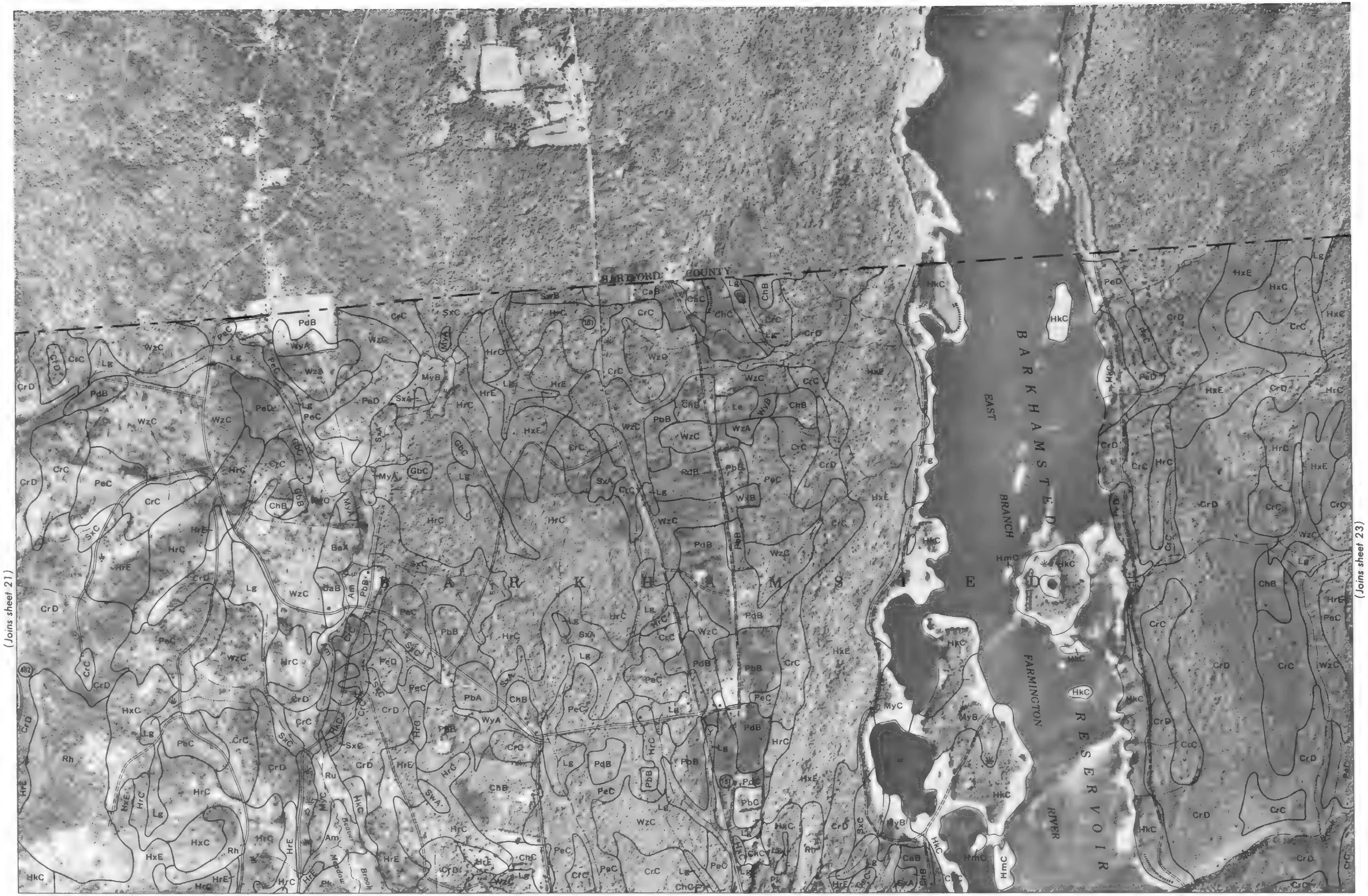
5000 Feet

Scale 1:15840

N

1 Mile
5000 Feet
Scale 1:15840
0 1000 2000 3000 4000 5000

(Joins sheet 21)



(Joins sheet 23)

(Joins sheet 31)

(Joins sheet 22)

(Joins sheet 32)


24
N
1 Mile
5000 Feet
Scale 1:15840
(Joins sheet 15)
(Joins sheet 25)
(Joins sheet 33)
NEW YORK
DUTCHESS COUNTY
INDIAN MOUNTAIN
SALISBURY
SHARON
Indian Mountain School
CAMP SLOANE
Wononpakook Lake
The Cedars
Indian Lake
Mudge Pond
GRAVEL PIT
361


(Joins sheet 16)
(Joins sheet 24)
(Joins sheet 26)
(Joins sheet 34)
N
Scale 1:15840
1 Mile
5000 Feet
SALISBURY
SALMON MOUNTAIN
SHARON MOUNTAIN
SHARON
Lime Rock
Forge Mountain
Beeslick Pond
Bauer Pond
Red Rocks
112
41

LITCHFIELD COUNTY, CONNECTICUT — SHEET NUMBER 26

(Joins sheet 17)

(Joins sheet 25)

(Joins sheet 27)

(Joins sheet 35)

N

Scale 1:15840

1 Mile

5000 Feet

0 1000 2000 3000 4000 5000

LITCHFIELD COUNTY, CONNECTICUT NO. 26


(Joins sheet 18)
27
N
(Joins sheet 26)
(Joins sheet 28)
(Joins sheet 36)
C A N A A N
N O R F O L K
C O R N W A L L
G O S H E N
Lower City
Lower City Cemetery
Hollenbeck
Brown Brook
Bear Swamp
Wildcat Swamp
Titus Mountain
Howe Mountain
1 Mile
5000 Feet
Scale 1:15840

(Joins sheet 19)

N

1 Mile
5000 Feet

Scale 1:15840

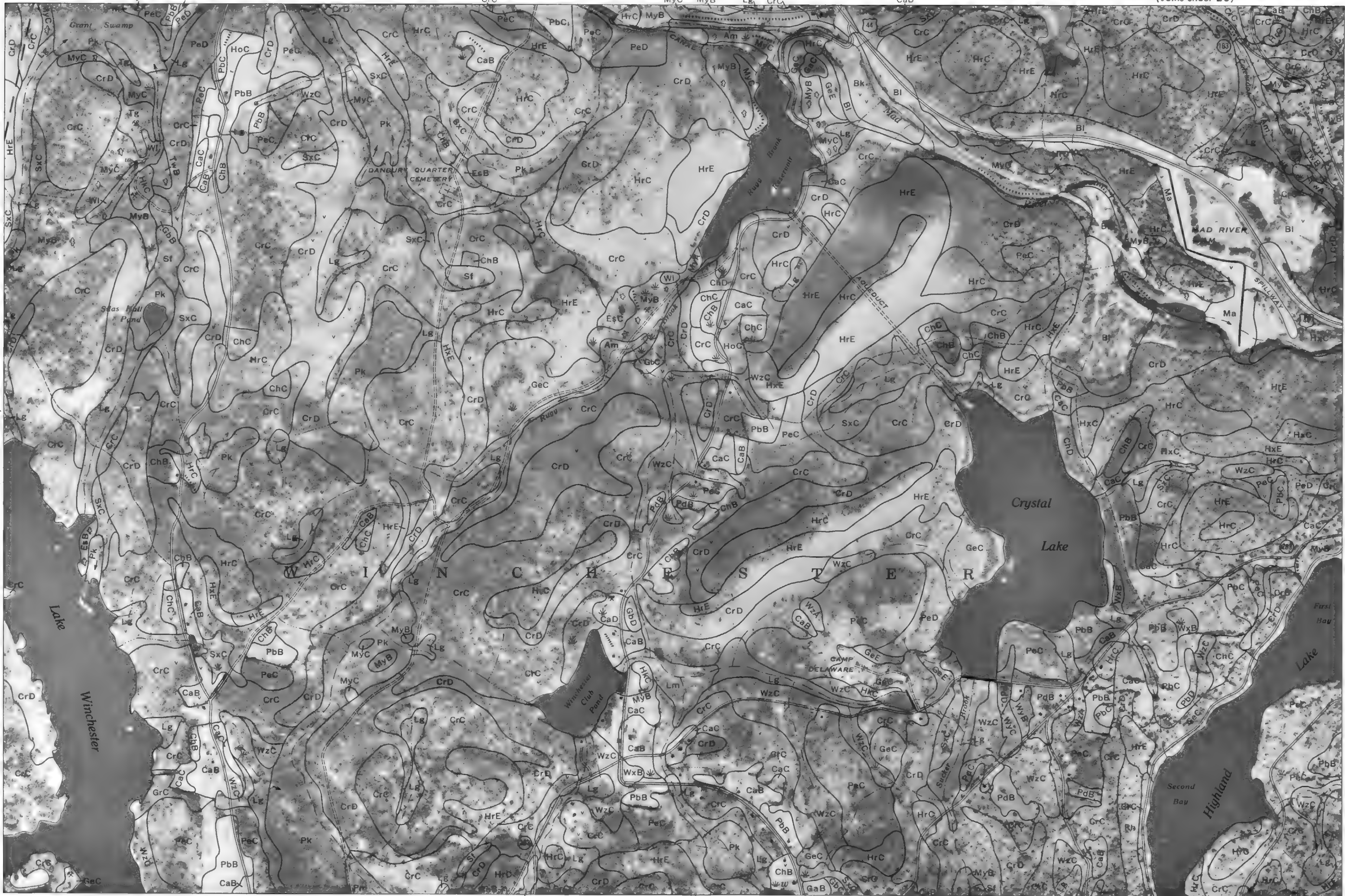
(Joins sheet 27)

(Joins sheet 29)

(Joins sheet 37)

(Joins sheet 20)

(Joins sheet 28)



(Joins sheet 30)

(Joins sheet 38)

N

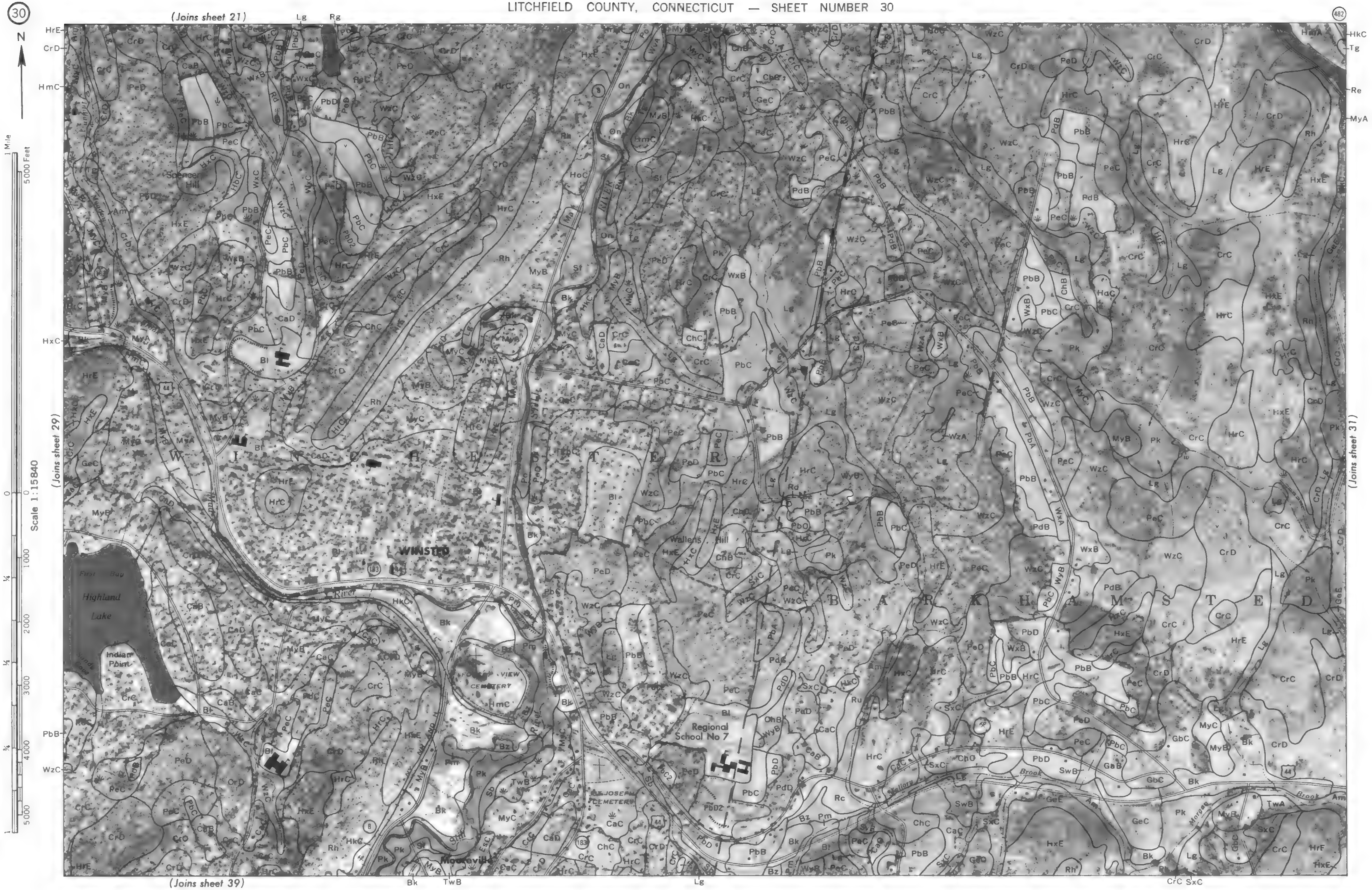
Scale 1:15840

1 Mile

5000 Feet

29

LITCHFIELD COUNTY, CONNECTICUT NO. 29


(Joins sheet 21)
(Joins sheet 29)
(Joins sheet 31)
(Joins sheet 39)
N
Scale 1:15840
1 Mile
5000 Feet
Spencer Hill
WINCHESTER
WINSTED
First Bay
Highland Lake
Indian Point
Wallens Hill
BARKHAMSTED
Regional School No 7
Mooreville

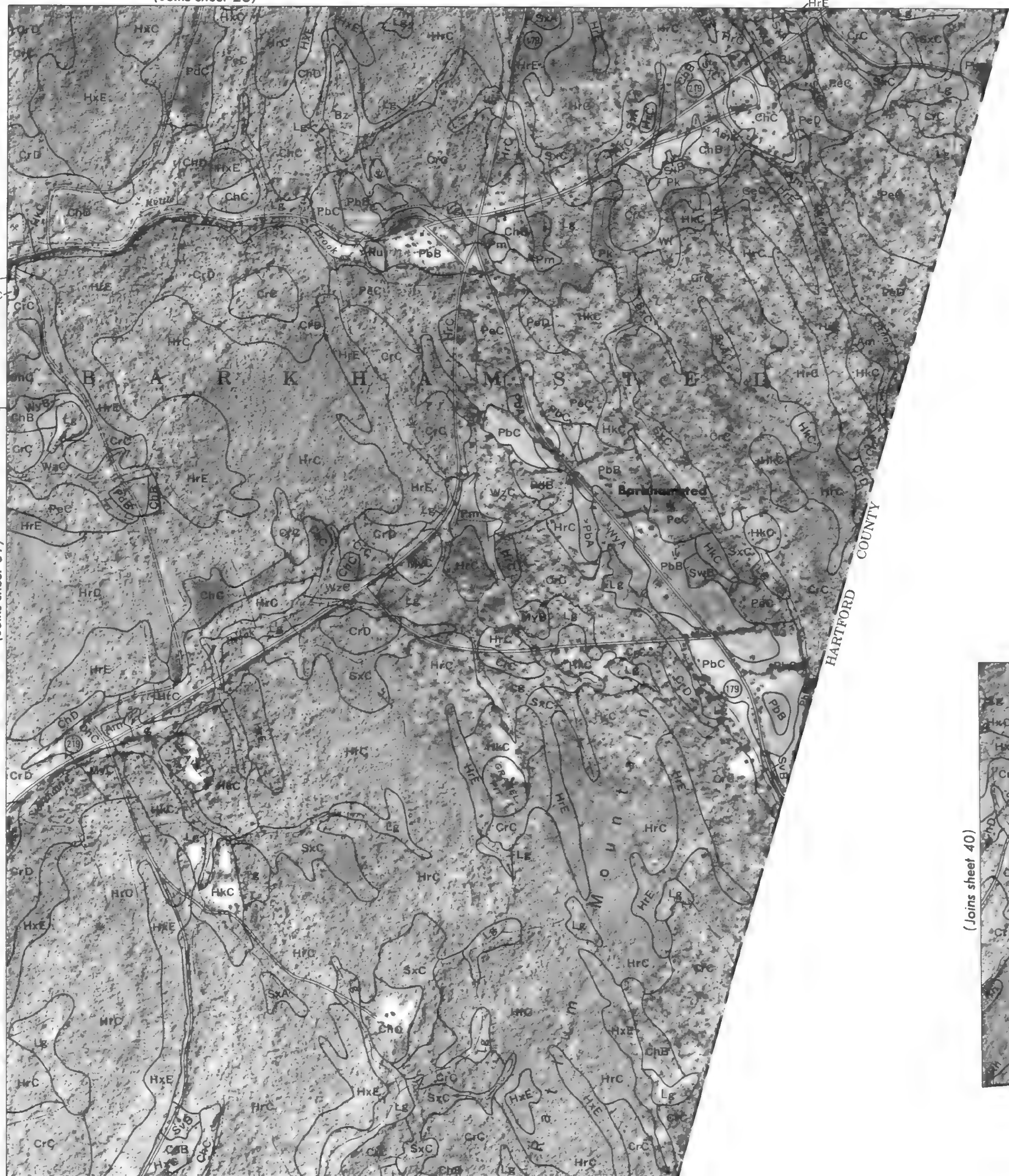

31
N
(Joins sheet 22)
(Joins sheet 30)
(Joins sheet 32)
(Joins sheet 40)
LITCHFIELD COUNTY, CONNECTICUT NO. 31
BARKHAMSTED
BARKHAMSTED RESERVOIR
EAST BRANCH FARMINGTON RIVER
WEST BRANCH FARMINGTON RIVER
Ragged Mountain
Barkhamsted Center
BARKHAMSTED CEMETERY
Pleasant Valley
Goose Green
RIVERSIDE CEMETERY
Compensating Reservoir
SAVILLE DAM
Scale 1:15 840
1 Mile
5000 Feet

N

1 Mile
5000 Feet
Scale 1:15840
0 1000 2000 3000 4000 5000
¼ ½ ¾ 1

(Joins sheet 23)

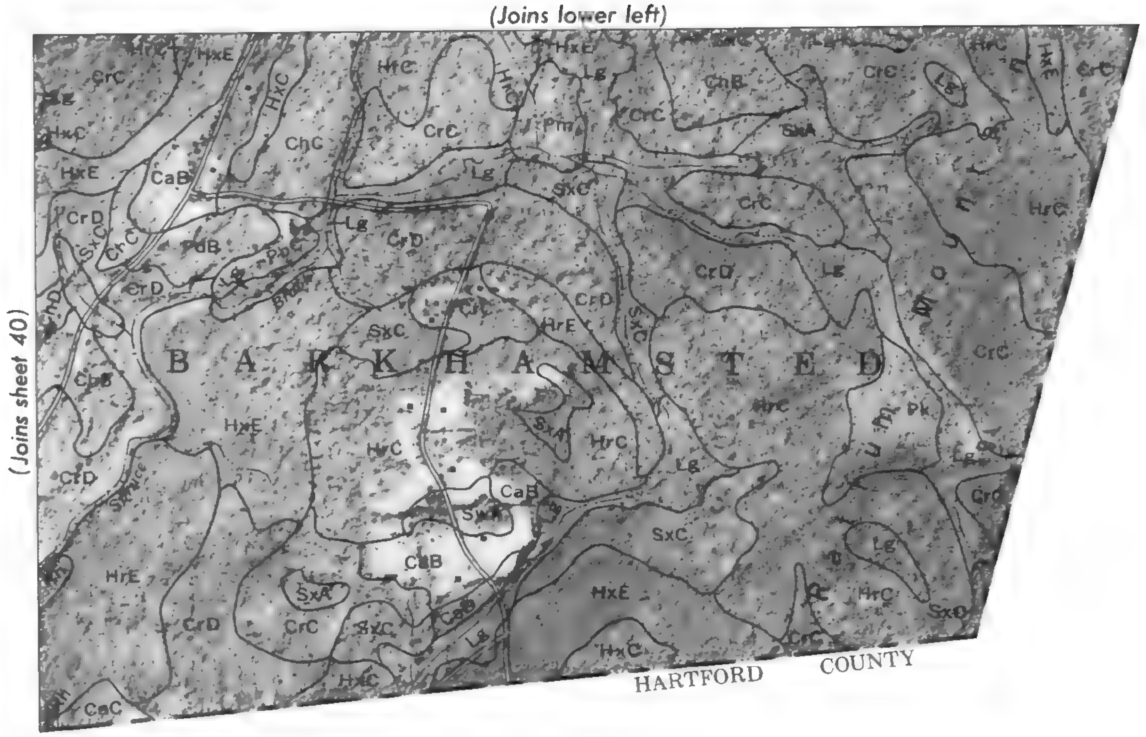
(Joins sheet 31)



(Joins inset)

(Joins lower left)

(Joins sheet 40)



(33)

(Joins sheet 24)

(Joins sheet 34)

(Joins sheet 41)

N

1 Mile

5000 Feet

Scale 1:15840

0 1000 2000 3000 4000 5000

0 ¼ ½ ¾ 1

(Joins sheet 25)

N

(Joins sheet 33)

(Joins sheet 35)

(Joins sheet 42)

Scale 1:15840

1 Mile

5000 Feet

35

(Joins sheet 26)

(Joins sheet 34)

(Joins sheet 36)

(Joins sheet 43)

N

1 Mile

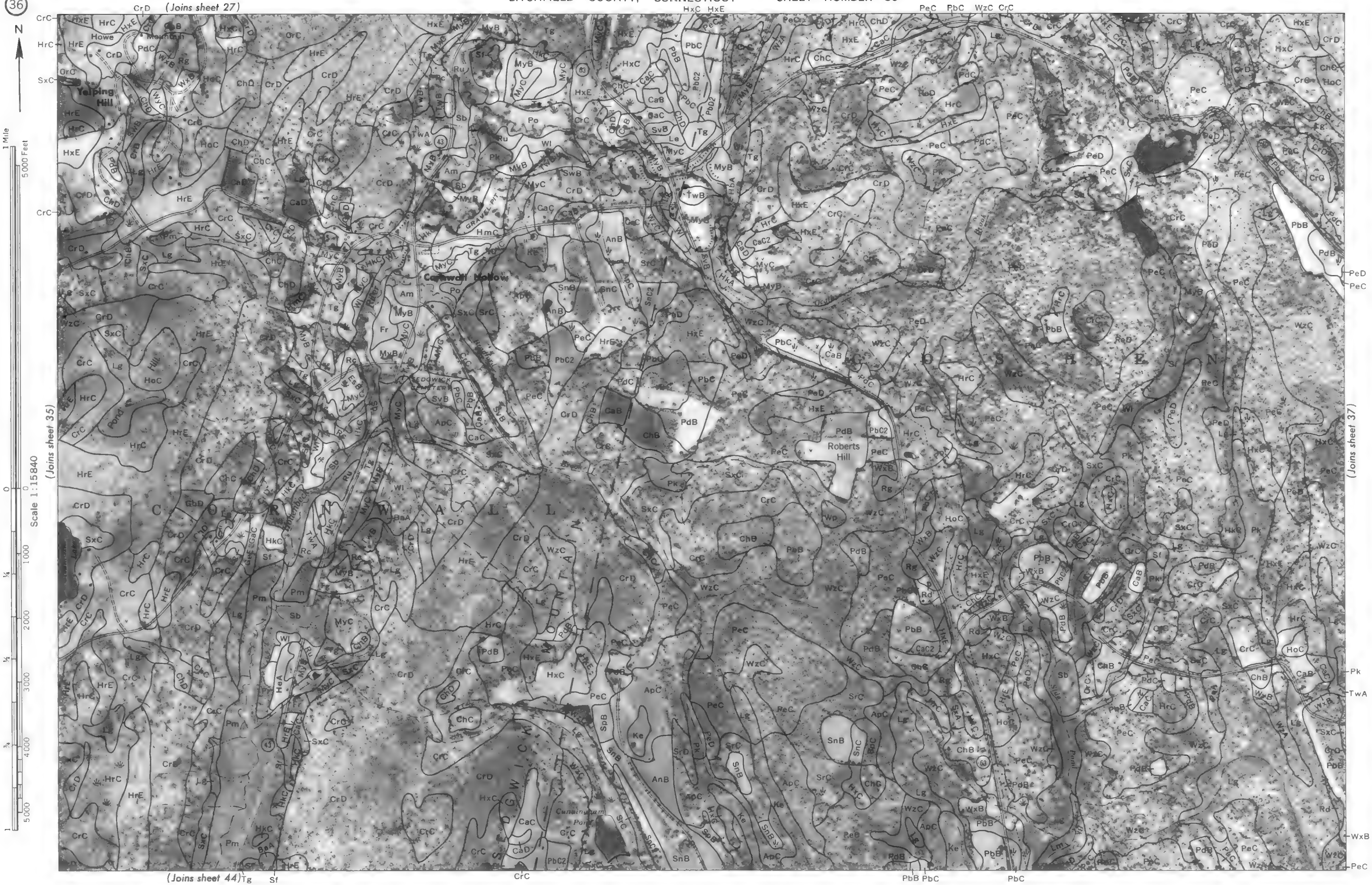
5000 Feet

0 1000 2000 3000 4000 5000

0 ¼ ½ ¾

Scale 1:15 840

LITCHFIELD COUNTY, CONNECTICUT NO. 35

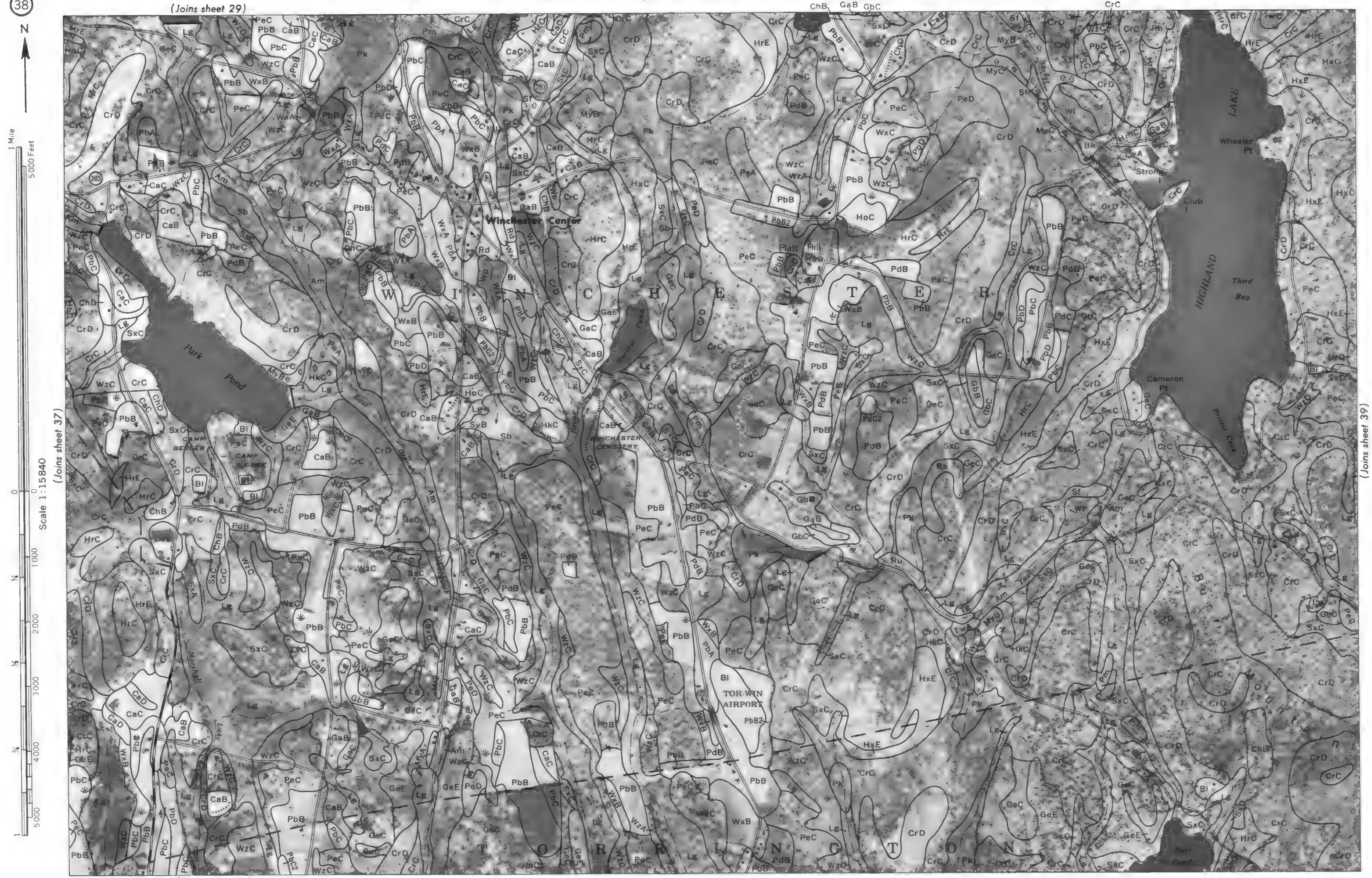


LITCHFIELD COUNTY, CONNECTICUT NO. 36


(Joins sheet 28)
(Joins sheet 36)
(Joins sheet 38)
(Joins sheet 45)
North Pond
North Goshen
G O S H E N
HALL MEADOW CEMETERY
GRAVEL PIT
Mount Ouleout
Ouleout Lake
W I N C H E S T E R
T O R R I N G T O N
Kelly Corner
Ivy Mountain
Reuben Hart Reservoir
N
1 Mile
5000 Feet
Scale 1:15840

LITCHFIELD COUNTY, CONNECTICUT — SHEET NUMBER 38

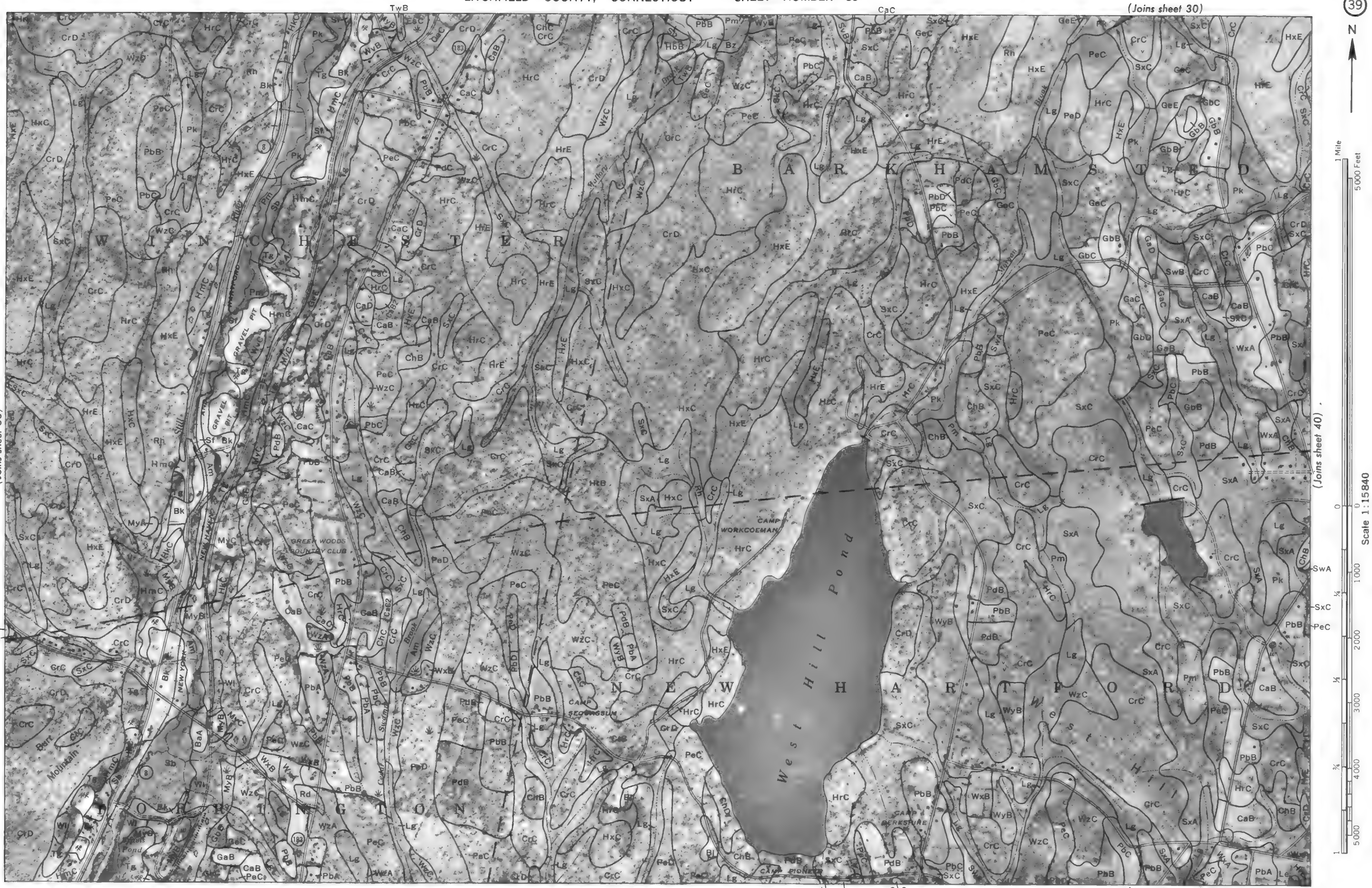
(Joins sheet 29)



(Joins sheet 37)

(Joins sheet 39)

(Joins sheet 46)


39
N
(Joins sheet 30)
(Joins sheet 38)
(Joins sheet 40)
(Joins sheet 47)
W I N C H E S T E R
B A R K H A M S T E D
N E W H A R T F O R D
T O R R I N G T O N
West Hill Pond
West Hill
CAMP WORKCOEMAN
CAMP SEQUASSUM
CAMP BERKSHIRE
CAMP PIONEER
GREEN WOODS COUNTRY CLUB
GRAVEL PIT
NEW HAVEN
NEW YORK
Still River
Burr Mountain
1 Mile
5000 Feet
Scale 1:15840


N
(Joins sheet 31)
(Joins inset, sheet 32)
(Joins sheet 39)
(Joins sheet 48)
Scale 1:15840
1 Mile
5000 Feet
BARKHAMSTED
EAST BRANCH
WEST BRANCH
COMPENSATING RESERVOIR
FARMINGTON RESERVOIR
NEW HARTFORD
FARMINGTON RIVER
New Hartford
RICHARDS CORNER DAM
PINE GROVE CEMETERY
Pine Meadow
HARTFORD COUNTY


41
N
(Joins sheet 33)
(Joins sheet 42)
(Joins sheet 49)
SHARON COUNTRY CLUB
Mitchelltown
S H A R O N
NEW YORK
DUTCHESS COUNTY
BOLLARD DISTRICT CEMETERY
Hatch Pond
Ford Pond
Bog Meadow Pond
Scale 1:15840
1 Mile
5000 Feet


(Joins sheet 34)
(Joins sheet 41)
(Joins sheet 43)
(Joins sheet 50)
N
Scale 1:15840
1 Mile
5000 Feet
SHARON
SHARON MOUNTAIN
EAST STREET CEMETERY
SHARON EASTSIDE CEMETERY
HOUSATONIC RIVER

LITCHFIELD COUNTY, CONNECTICUT NO. 43

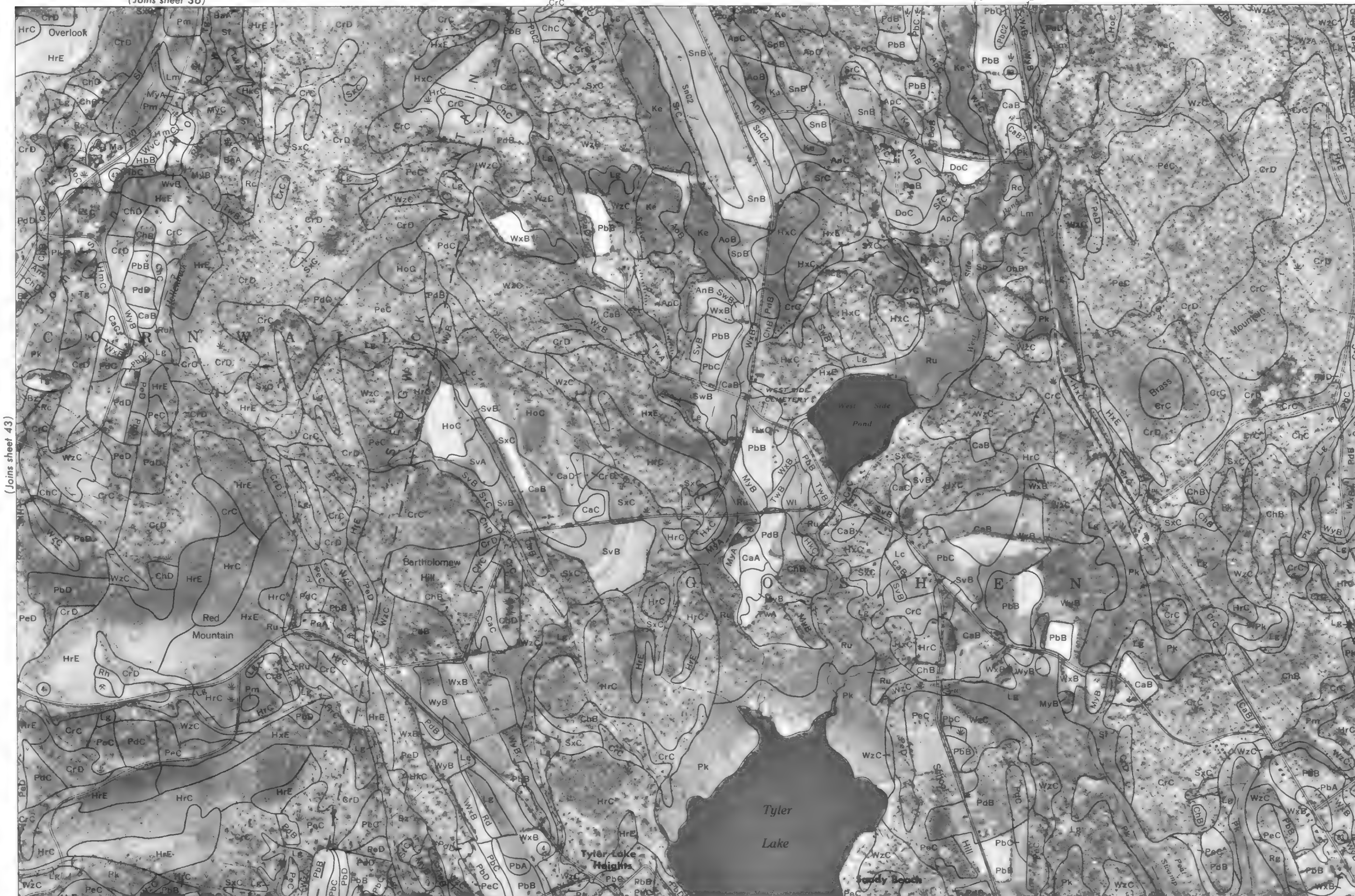
(Joins sheet 36)

N

Scale 1:15840

1 Mile
5000 Feet

(Joins sheet 43)



(Joins sheet 45)

(Joins sheet 52)


45
(Joins sheet 37)
(Joins sheet 44)
(Joins sheet 46)
(Joins sheet 53)
N
Ivy Mountain
Reuben Hart Reservoir
HALL MEADOW BK
DAM
Hall Meadow Bk
G O S H E N
T O R R I N G T O N
Whist Pond
Mideon Pond
Drakeville
Lucas Hill
Beech Hill
EAST CEMETERY
Brandy Hill
Rathshebaw Reservoir
272
1 Mile
5000 Feet
Scale 1:15840
0
1000
2000
3000
4000
5000
¼
½
¾


N
(Joins sheet 38)
(Joins sheet 45)
(Joins sheet 47)
(Joins sheet 54)
Scale 1:15840
1 Mile
5000 Feet
Newfield
NEWFIELD CEMETERY
Walnut Mountain
T O R R I N G T O N
Burr Pond
Burrville
Stillwater Pond
West Branch
Naugatuck River
SONS OF JACOB CEMETERY
Lake
272

47

(Joins sheet 39)

LITCHFIELD COUNTY, CONNECTICUT NO. 47

(Joins sheet 46)

(Joins sheet 48)

(Joins sheet 55)

N

1 Mile

5000 Feet

Scale 1:15840

0 1000 2000 3000 4000 5000

(Joins sheet 40)

(Joins sheet 47)

(Joins sheet 56)

(Joins sheet 41)

49

N

(Joins sheet 50)

(Joins sheet 57)

LITCHFIELD COUNTY, CONNECTICUT NO. 49

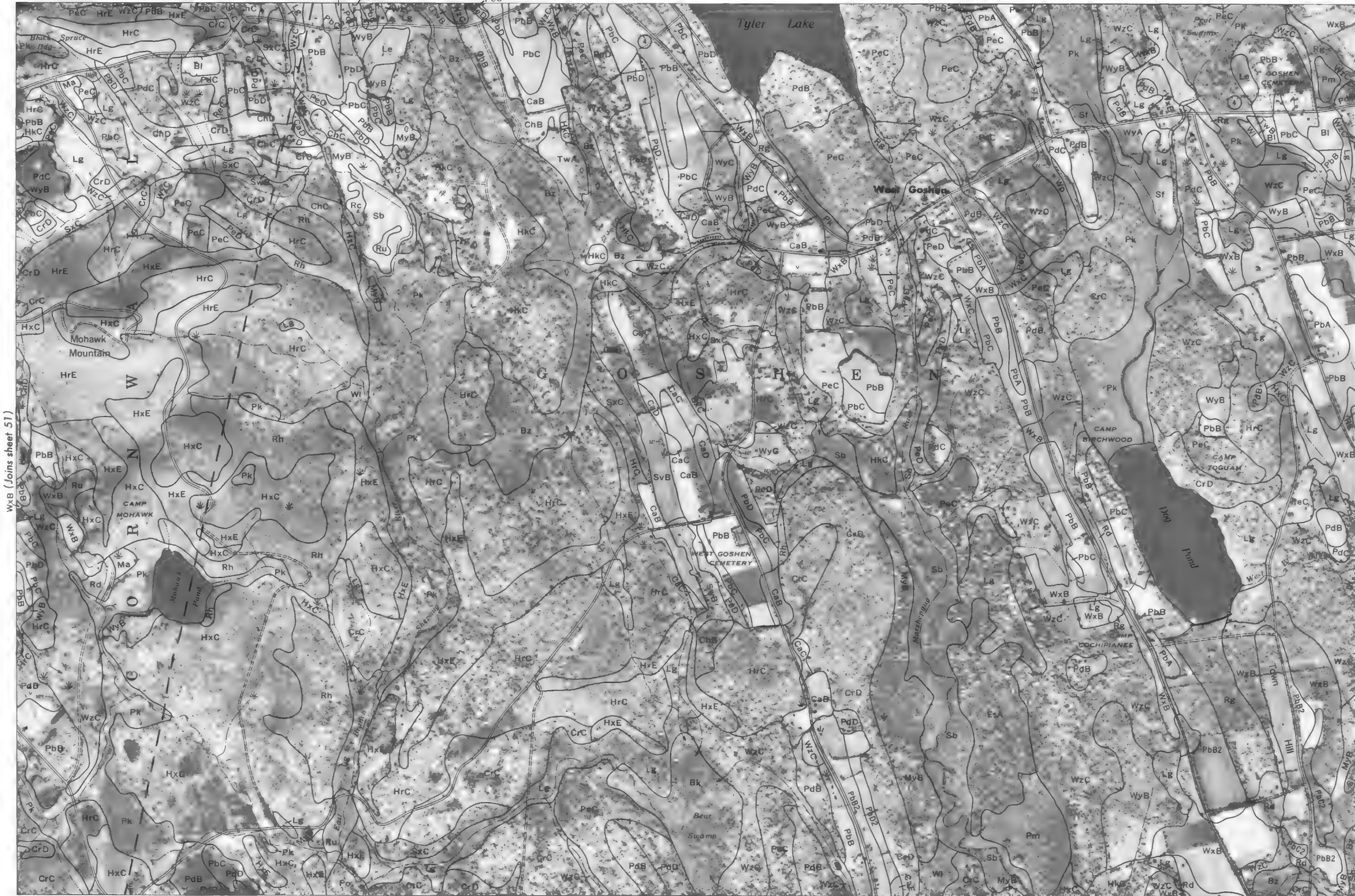
1 Mile
5000 Feet
Scale 1:15840
0 ¼ ½ ¾ 1
0 1000 2000 3000 4000 5000

LITCHFIELD COUNTY, CONNECTICUT NO. 50


51
(Joins sheet 43)
(Joins sheet 50)
(Joins sheet 52)
(Joins sheet 59)
LITCHFIELD COUNTY, CONNECTICUT NO. 51
N
Scale 1:15840
1 Mile
5000 Feet
Cornwall Bridge
Dean Hill
Mine Mountain
Pople Swamp
Mount Coltsfoot
Coltsfoot Valley
White Rock
East Street
The Pinnacle
Black Spruce Bog
Clark Pond
East Cornwall
Bald Mountain
Dudleytown Hill
Woodbury Mountain
The Crooked Bones
CORNWALL

(Joins sheet 44)

N



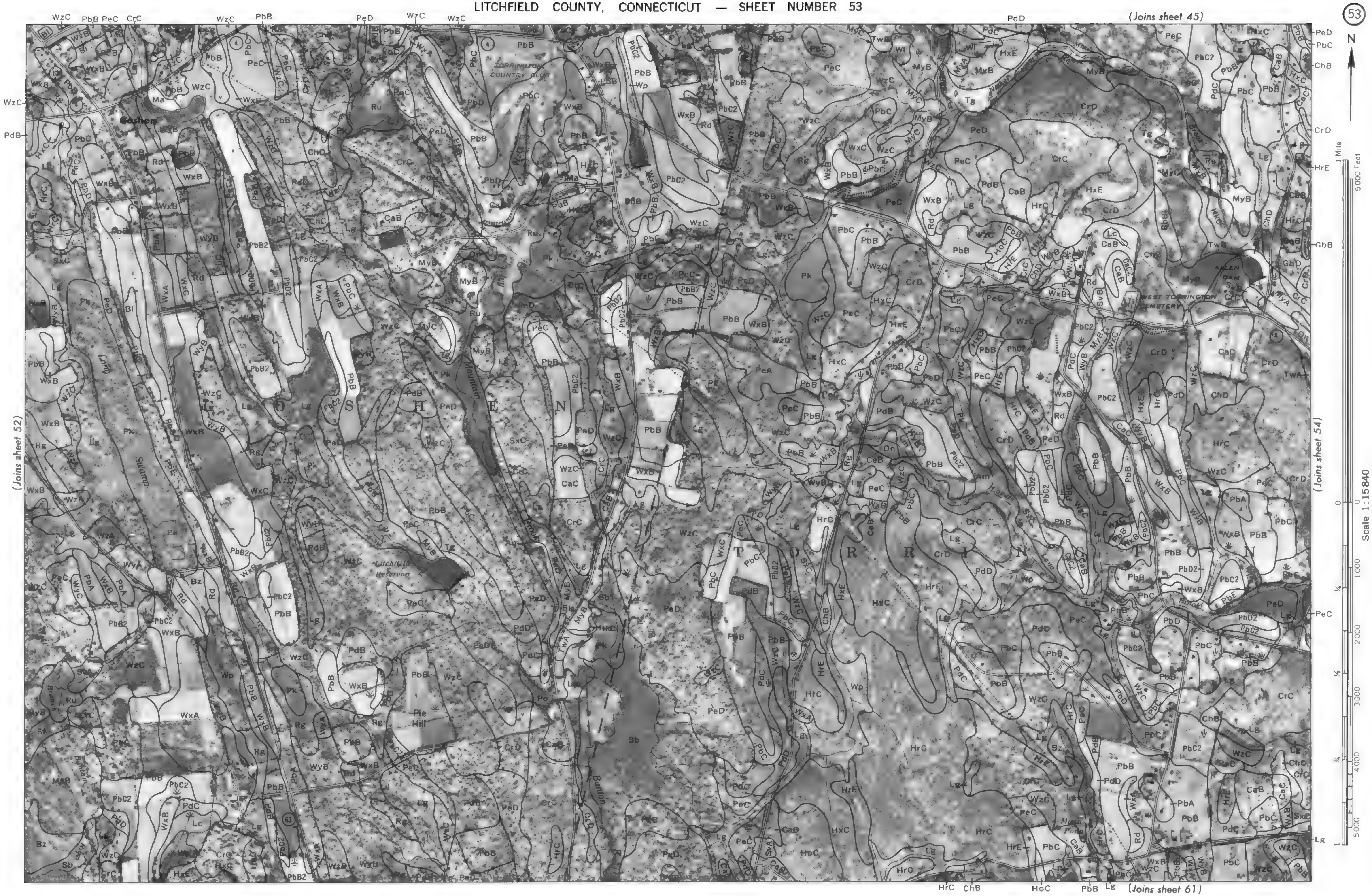
(Joins sheet 51)

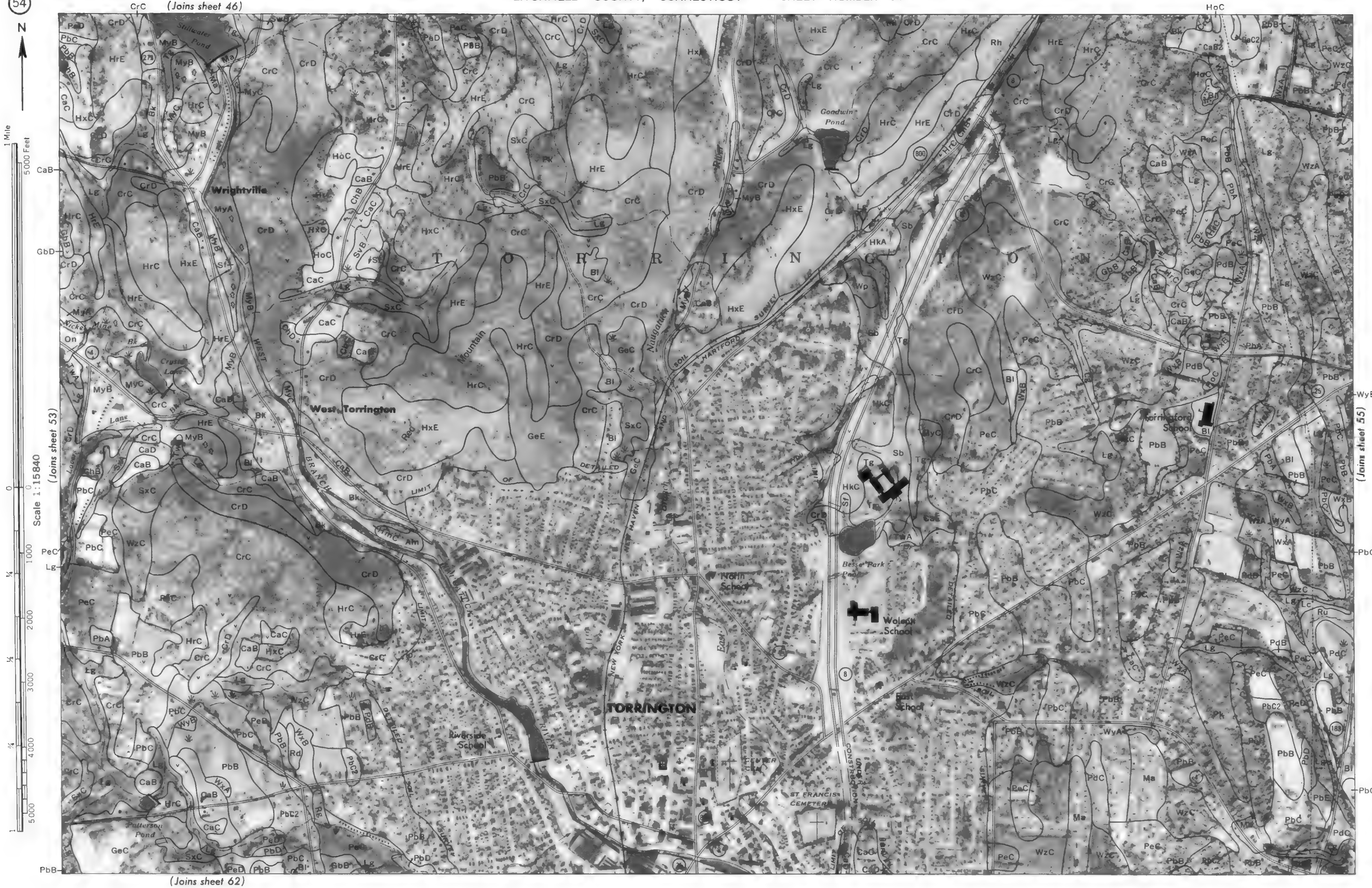
(Joins sheet 53)

(Joins sheet 60)

1 Mile
5000 Feet
Scale 1:15840
0 1000 2000 3000 4000 5000

LITCHFIELD COUNTY, CONNECTICUT NO. 52


53
N
(Joins sheet 45)
(Joins sheet 52)
(Joins sheet 54)
(Joins sheet 61)
TORRINGTON COUNTRY CLUB
Goshen
G O S H E N
T O R R I N G T O N
Litchfield Reservoir
Pie Hill
ALLEN DAM
WEST TORRINGTON CEMETERY
Swamp
Mountain
Bantam
1 Mile
5000 Feet
Scale 1:15840


N
(Joins sheet 46)
(Joins sheet 53)
(Joins sheet 55)
(Joins sheet 62)
1 Mile
5000 Feet
Scale 1:15840
T O R R I N G T O N
Wrightville
West Torrington
TORRINGTON
Stillwater Pond
Goodwin Pond
Crystal Lake
Patterson Pond
Riverside School
North School
East School
Torrington School
Besse Park
ST FRANCIS CEMETERY
Mountain
Naugatuck River
WEST BRANCH
DETAILED SOIL SURVEY
HARTFORD
NEW HAVEN
NEW YORK

55

(Joins sheet 47)

(Joins sheet 54)

(Joins sheet 56)

(Joins sheet 63)

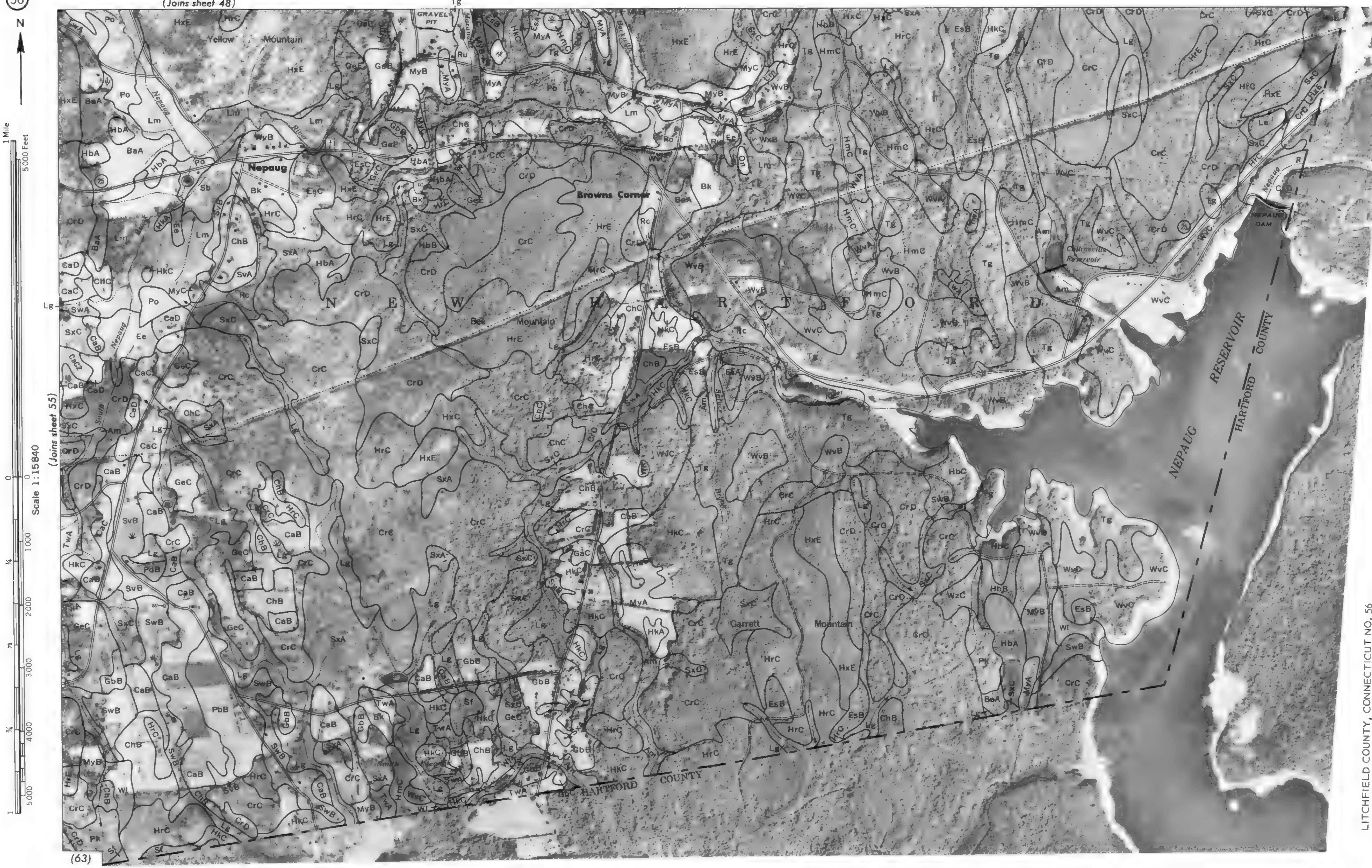
N

1 Mile

5000 Feet

Scale 1:15840

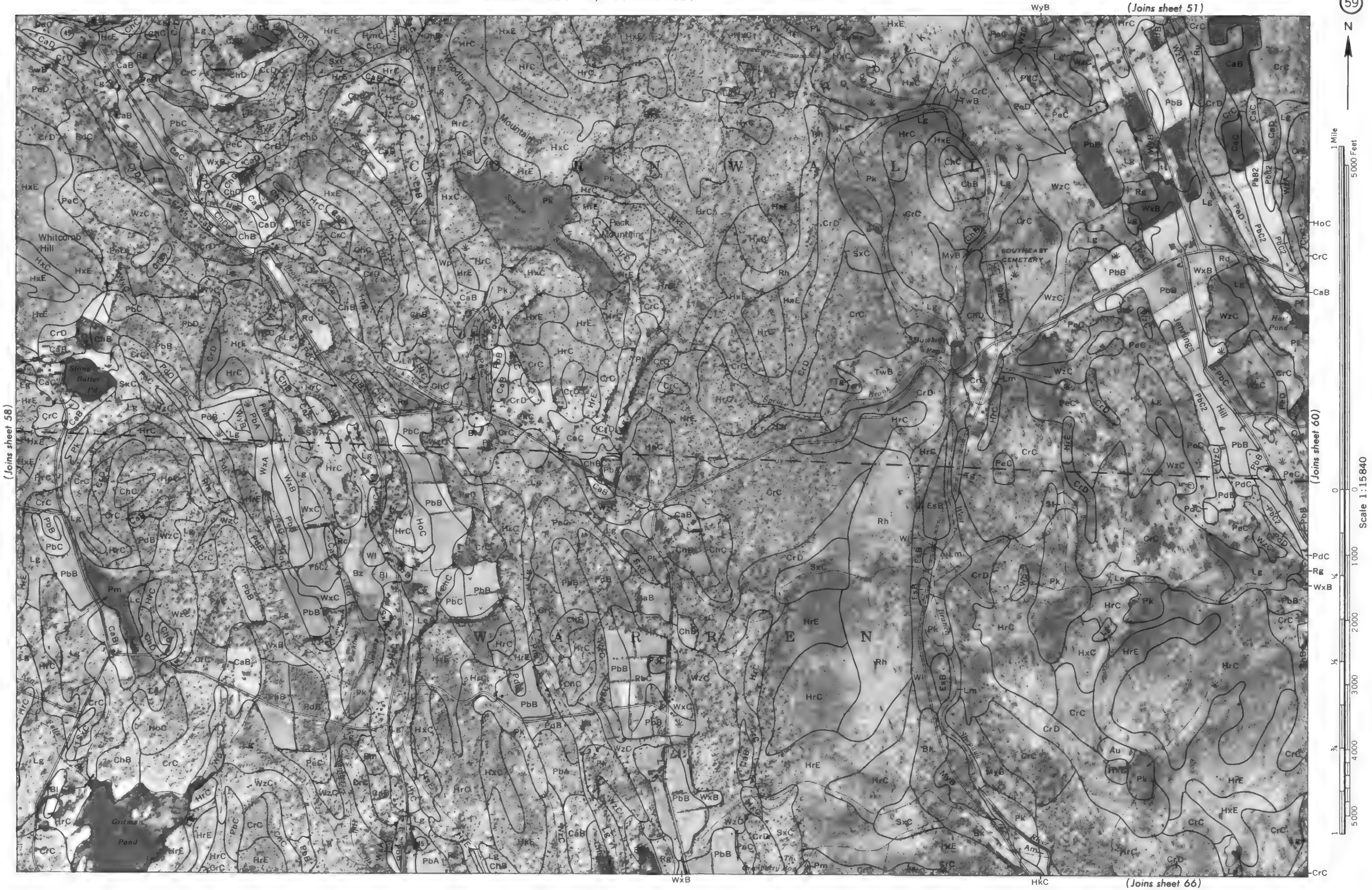
LITCHFIELD COUNTY, CONNECTICUT NO. 55

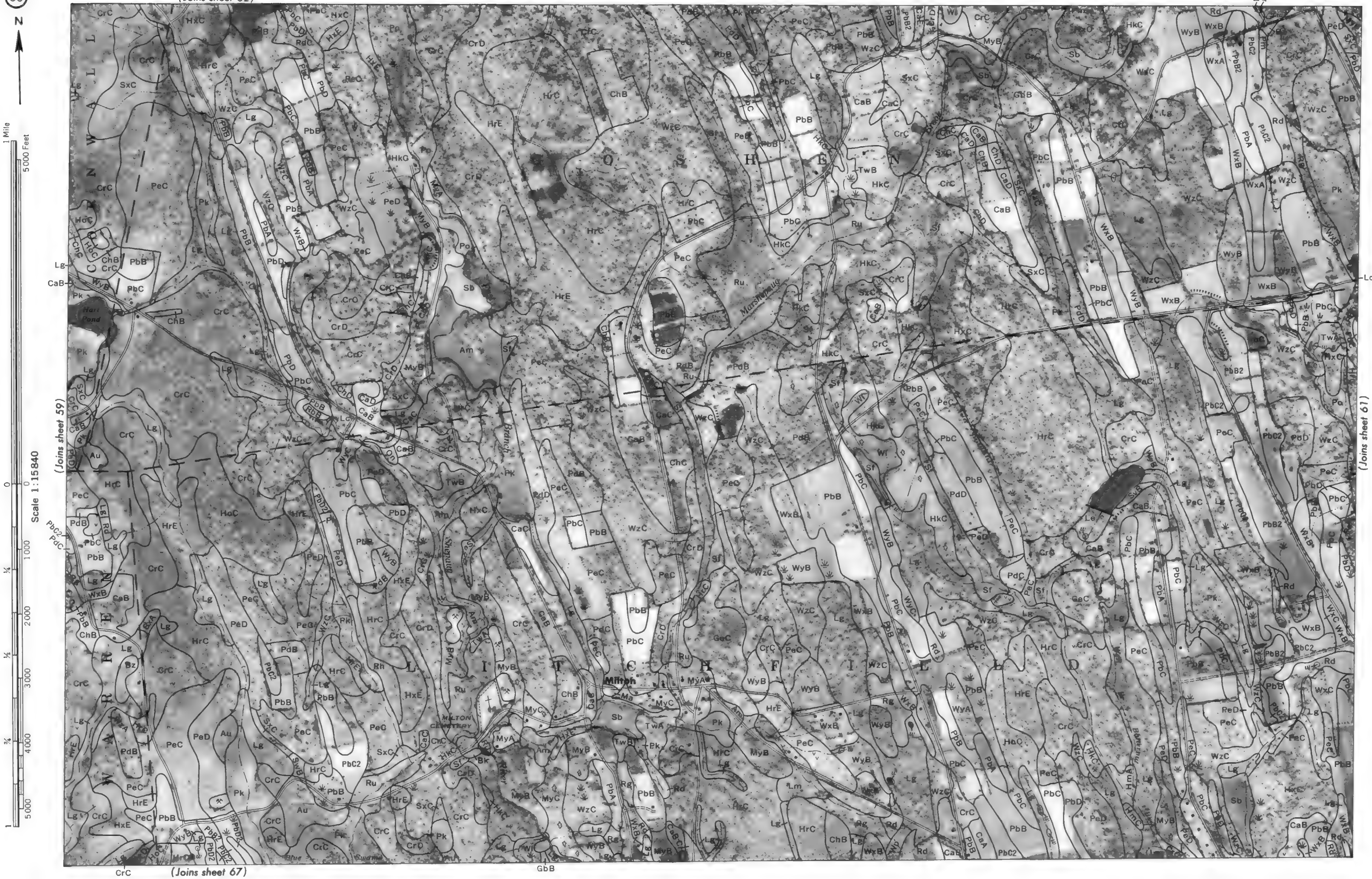

N
(Joins sheet 48)
(Joins sheet 55)
(63)
Scale 1:15840
1 Mile
5000 Feet
Yellow Mountain
Nepaug
Browns Corner
Bee Mountain
N E W H A R T F O R D
Garrett Mountain
NEPAUG RESERVOIR
HARTFORD COUNTY
NEPAUG DAM
Collinsville Reservoir
GRAVEL PIT
HARTFORD COUNTY


57
N
(Joins sheet 49)
(Joins sheet 58)
(Joins sheet 64)
Hilltop Pond
Cobble Mountain
Skiff Mountain
Pine Swamp
Mountain
Case Pond
Blaitz Pond
Richards Pond
Swamp
DUTCHESS COUNTY
NEW YORK
S H A R O N
K E N T
1 Mile
5000 Feet
Scale 1:15840
0
1000
2000
3000
4000
5000
¼
½
¾
1

LITCHFIELD COUNTY, CONNECTICUT — SHEET NUMBER 58

LITCHFIELD COUNTY, CONNECTICUT NO. 59




(Joins sheet 52)
(Joins sheet 59)
(Joins sheet 61)
(Joins sheet 67)
N
1 Mile
5000 Feet
Scale 1:15840
0
1000
2000
3000
4000
5000
¼
½
¾
1
G O S H E N
L I T C H F I E L D
C O R N W A L L
W A R R E N
Hart Pond
Marshepaug
Branch
Shepaug
River
Milton
MILTON CEMETERY
Blue Swamp


61
N
(Joins sheet 53)
(Joins sheet 60)
(Joins sheet 62)
(Joins sheet 68)
G O S H E N
T O R R I N G T O N
L I T C H F I E L D
Junior Republic of Connecticut
1 Mile
5000 Feet
0
1000
2000
3000
4000
5000
Scale 1:15840

(62)

LITCHFIELD COUNTY, CONNECTICUT — SHEET NUMBER 62

LITCHFIELD COUNTY, CONNECTICUT NO. 62

63

(Joins sheet 55) | (56)

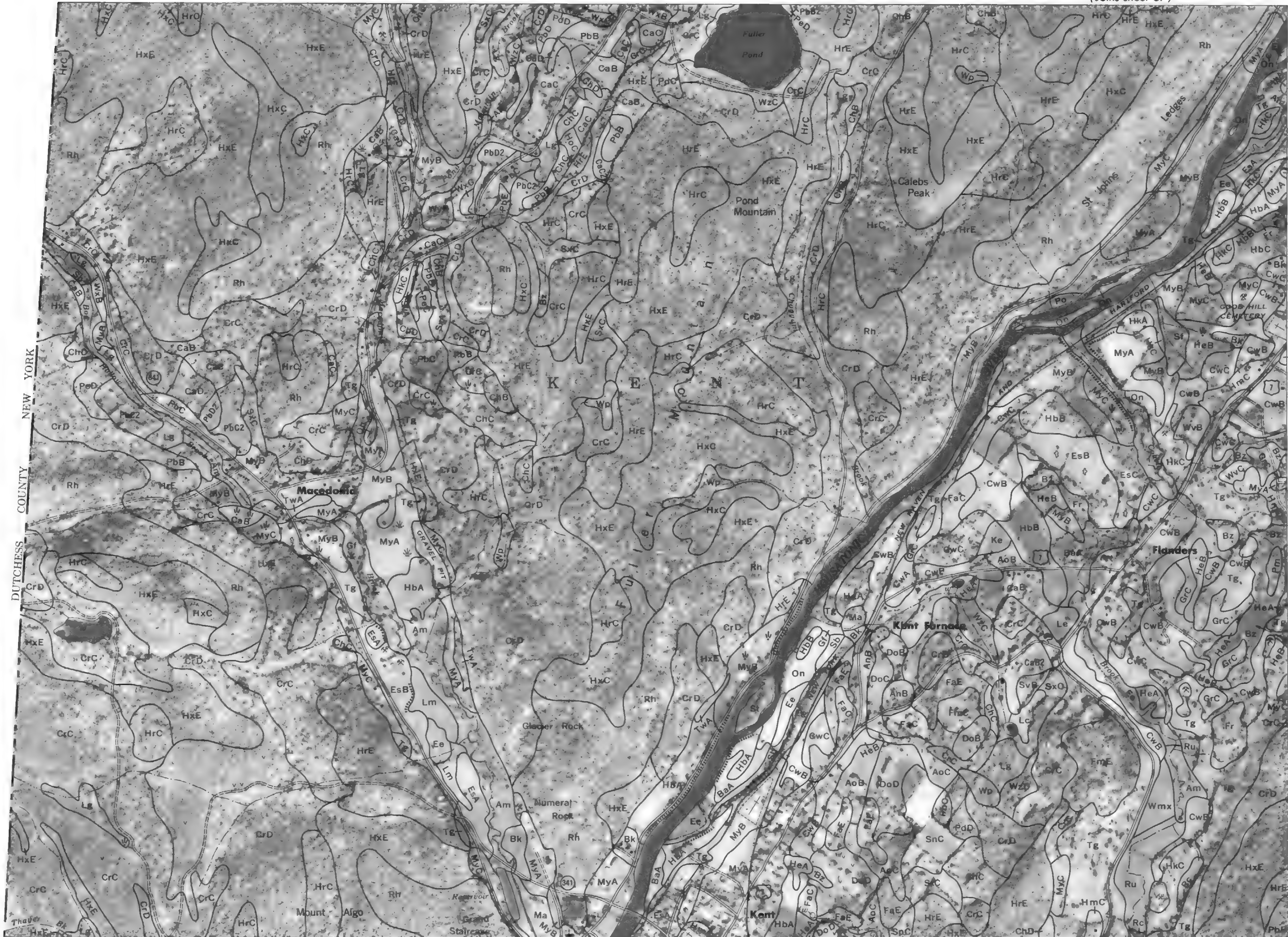
LITCHFIELD COUNTY, CONNECTICUT NO. 63
(Joins sheet 62)

1 Mile
5000 Feet
0
1000
2000
3000
4000
5000
Scale 1:15840

(Joins sheet 70) | (Inset, 78)

N

(Joins sheet 57)



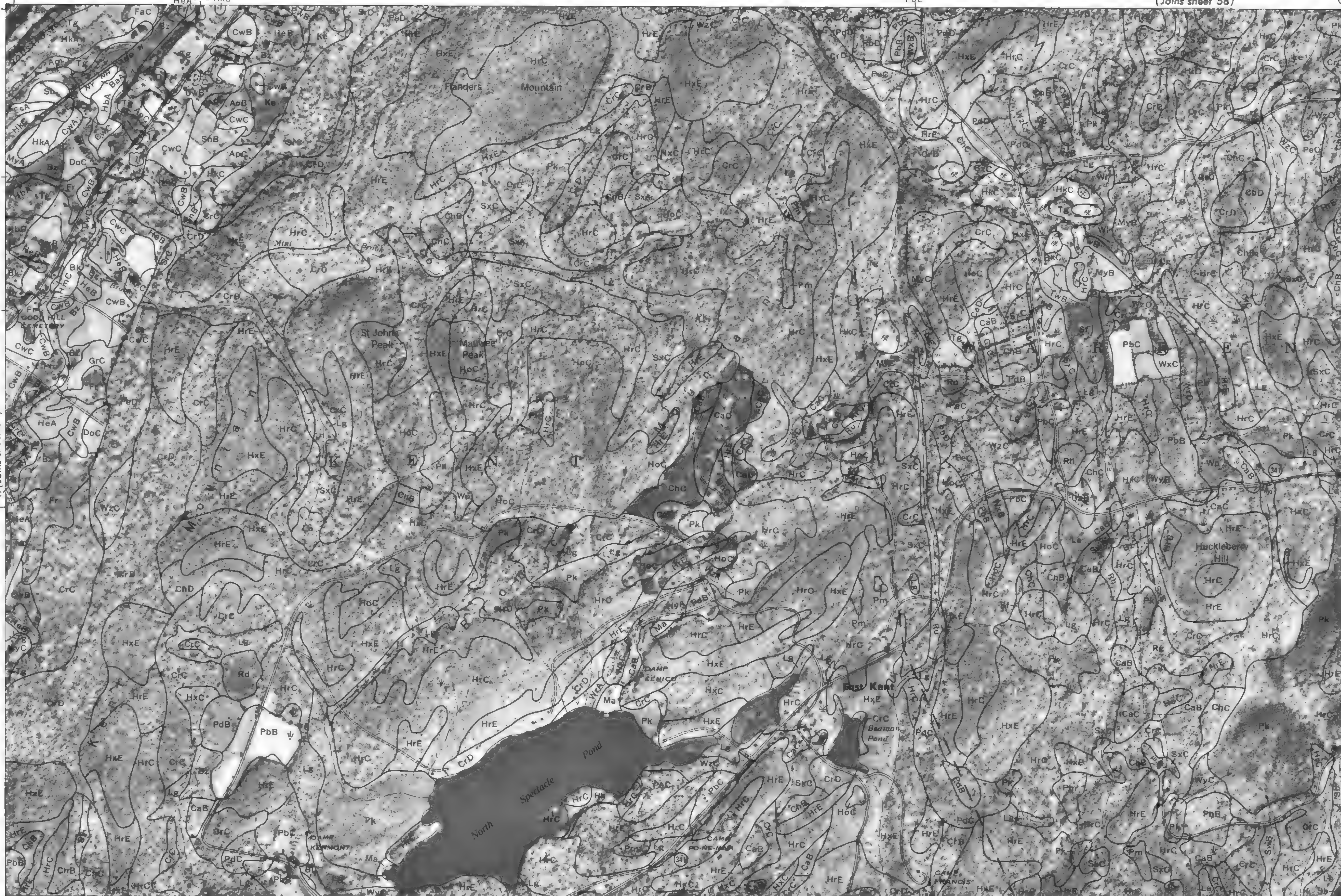
(Joins sheet 65)

(Joins sheet 71)

1 Mile
5000 Feet
Scale 1:15840
0 1000 2000 3000 4000 5000
0 ¼ ½ ¾ 1

65

(Joins sheet 58)



(Joins sheet 64)

(Joins sheet 66)

(Joins sheet 72)

N

1 Mile

5000 Feet

Scale 1:15840

(Joins sheet 59)

(Joins sheet 73)

67

LITCHFIELD COUNTY, CONNECTICUT NO. 67

(Joins sheet 60)

(Joins sheet 66)

(Joins sheet 68)

(Joins sheet 74)

N

1 Mile

5000 Feet

Scale 1:15840


68
N
(Joins sheet 61)
(Joins sheet 67)
(Joins sheet 69)
(Joins sheet 75)
1 Mile
5000 Feet
Scale 1:15840
Litchfield
St Louis De Montfort Seminary
Jefferson Hill
Plumb Hill
WEST CEMETERY
Little Pond
SEWAGE DISPOSAL
Duck Pond
Ripley Swamp
GRAVEL PIT
Wamogo School
BANTAM
Chestnut Hill


(Joins sheet 62)
(Joins sheet 68)
(Joins sheet 70)
(Joins sheet 76)
69
N
East Litchfield
Scovill Hill
Pine Cobble
Jefferson Hill
Campville
L I T C H F I E L D
H A R W I N T O N
NAUGATUCK RIVER
NEW YORK NEW HAVEN AND HARTFORD
Brook
Jefferson
Hill
Pudding
Pickett
GRAVEL
UNDER CONSTRUCTION
1 Mile
5000 Feet
Scale 1:15840
0
1000
2000
3000
4000
5000
¼
½
¾
1

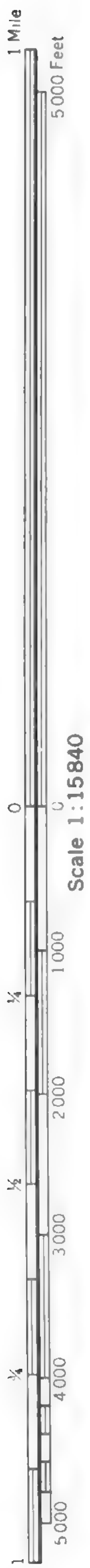
N

(Joins sheet 63)

(Joins sheet 69)

(Joins inset, sheet 78)

(Joins sheet 77)



71

LITCHFIELD COUNTY, CONNECTICUT NO. 71

(Joins sheet 64)

(Joins sheet 72)

(Joins sheet 79)

N

1 Mile

5000 Feet

Scale 1:15840

LITCHFIELD COUNTY, CONNECTICUT — SHEET NUMBER 72

(Joins sheet 65)

N

1 Mile

5000 Feet

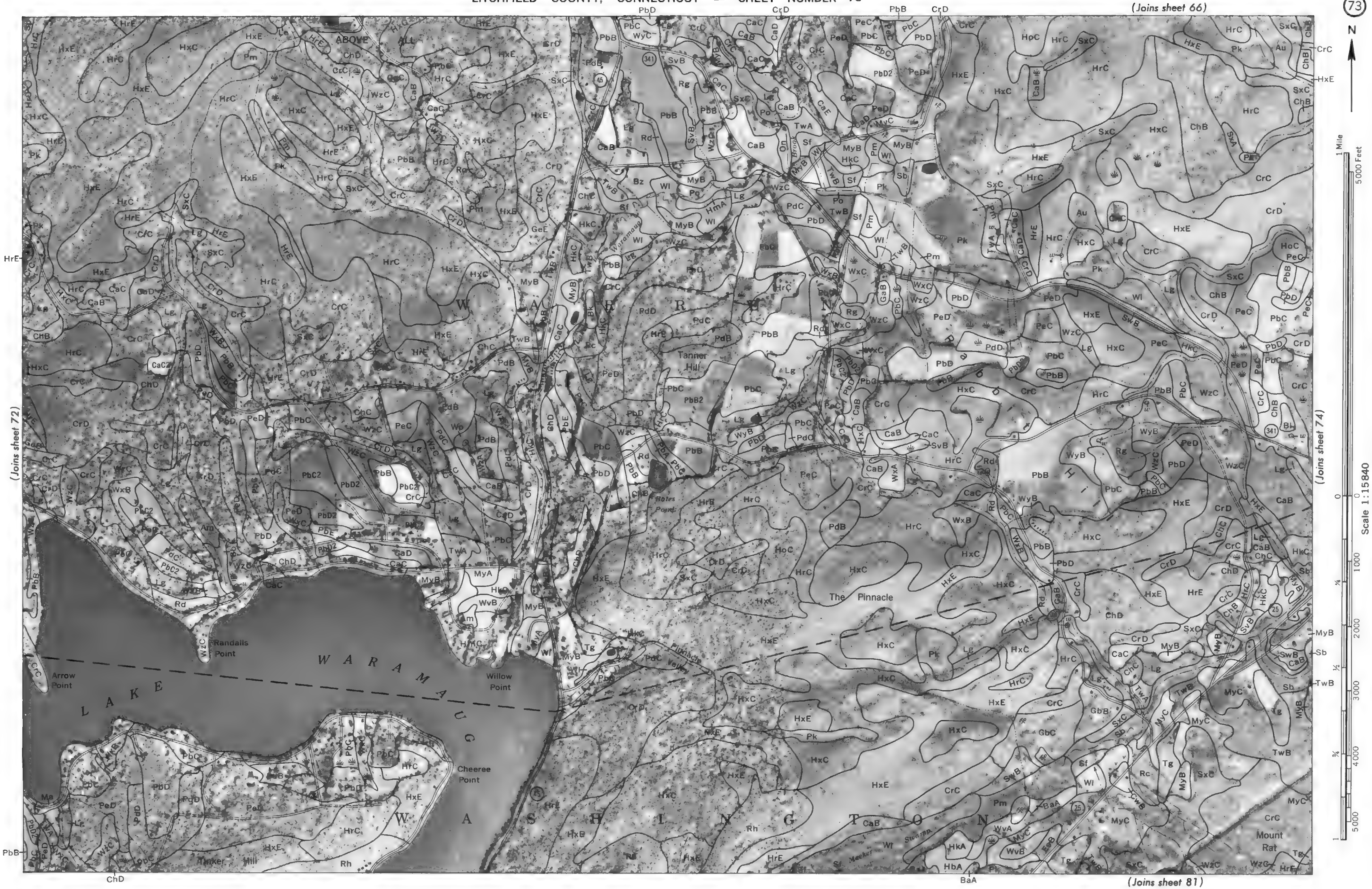
Scale 1:15840

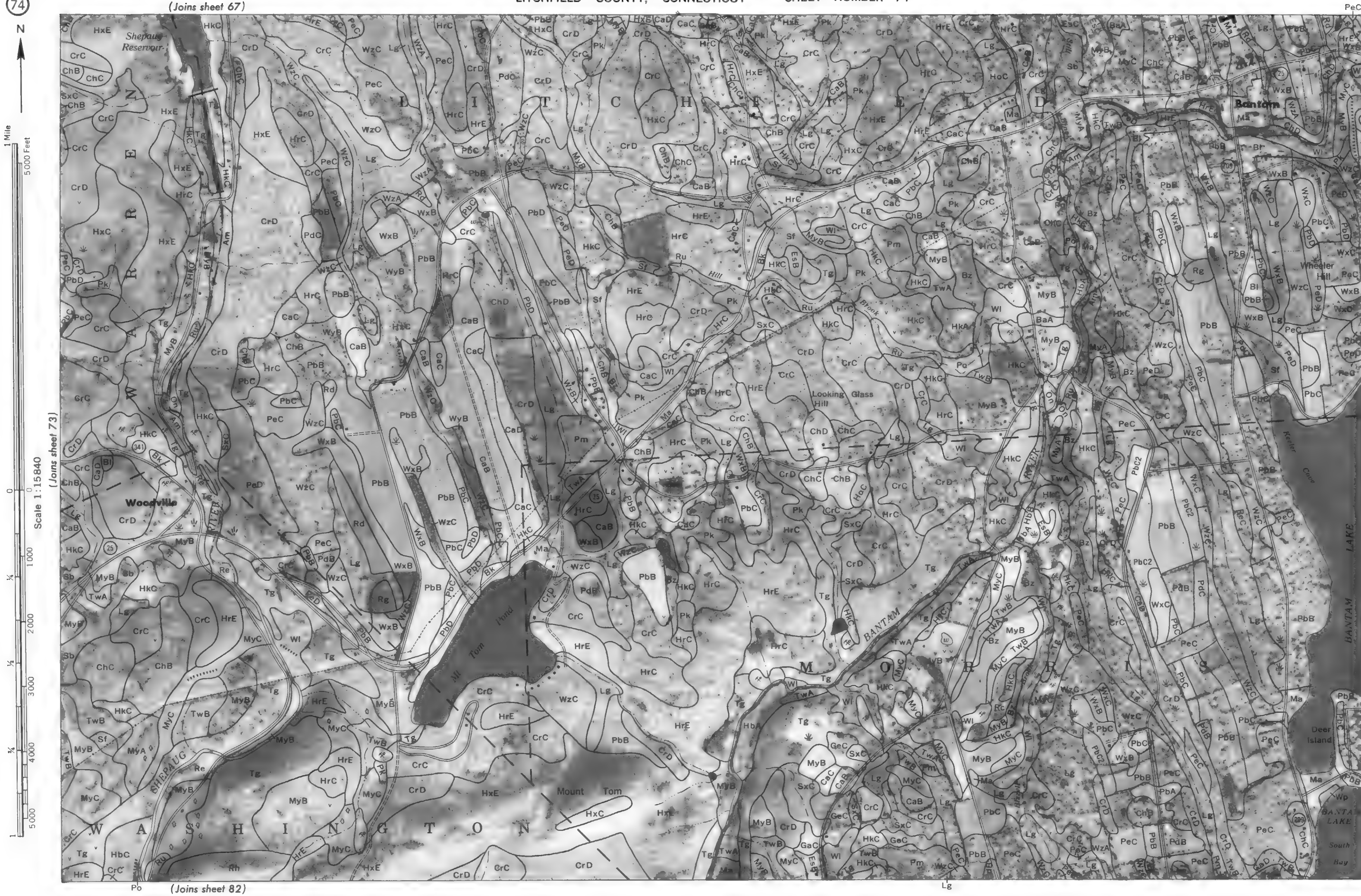
(Joins sheet 71)

(Joins sheet 73)

(Joins sheet 80)

LITCHFIELD COUNTY, CONNECTICUT NO. 72


(Joins sheet 66)
(Joins sheet 72)
(Joins sheet 74)
(Joins sheet 81)
LITCHFIELD COUNTY, CONNECTICUT NO. 73
N
1 Mile
5000 Feet
Scale 1:15840
W A R R E N
W A S H I N G T O N
LAKE WARAMAUG
Tanner Hill
Hatch Pond
The Pinnacle
Randalls Point
Arrow Point
Willow Point
Cheeree Point
Tinker Hill
Mount Rat
Pinnacle Valley
Meeker Swamp
Waramaug
Brook
ABOVE ALL


74
N
(Joins sheet 67)
(Joins sheet 73)
(Joins sheet 75)
(Joins sheet 82)
Scale 1:15 840
1 Mile
5000 Feet
Shepaug Reservoir
Woodville
Bantam
Looking Glass Hill
Wheeler Hill
Mount Tom
Mt Tom Pond
Deer Island
BANTAM LAKE
South Bay
Keeler Cove
SHEPAUG RIVER
BANTAM RIVER
L I T C H F I E L D
W A R R E N
M O R R I S
W A S H I N G T O N

(Joins sheet 68)

75

N

(Joins sheet 74)

(Joins sheet 76)

(Joins sheet 83)

1 Mile

5000 Feet

Scale 1:15840

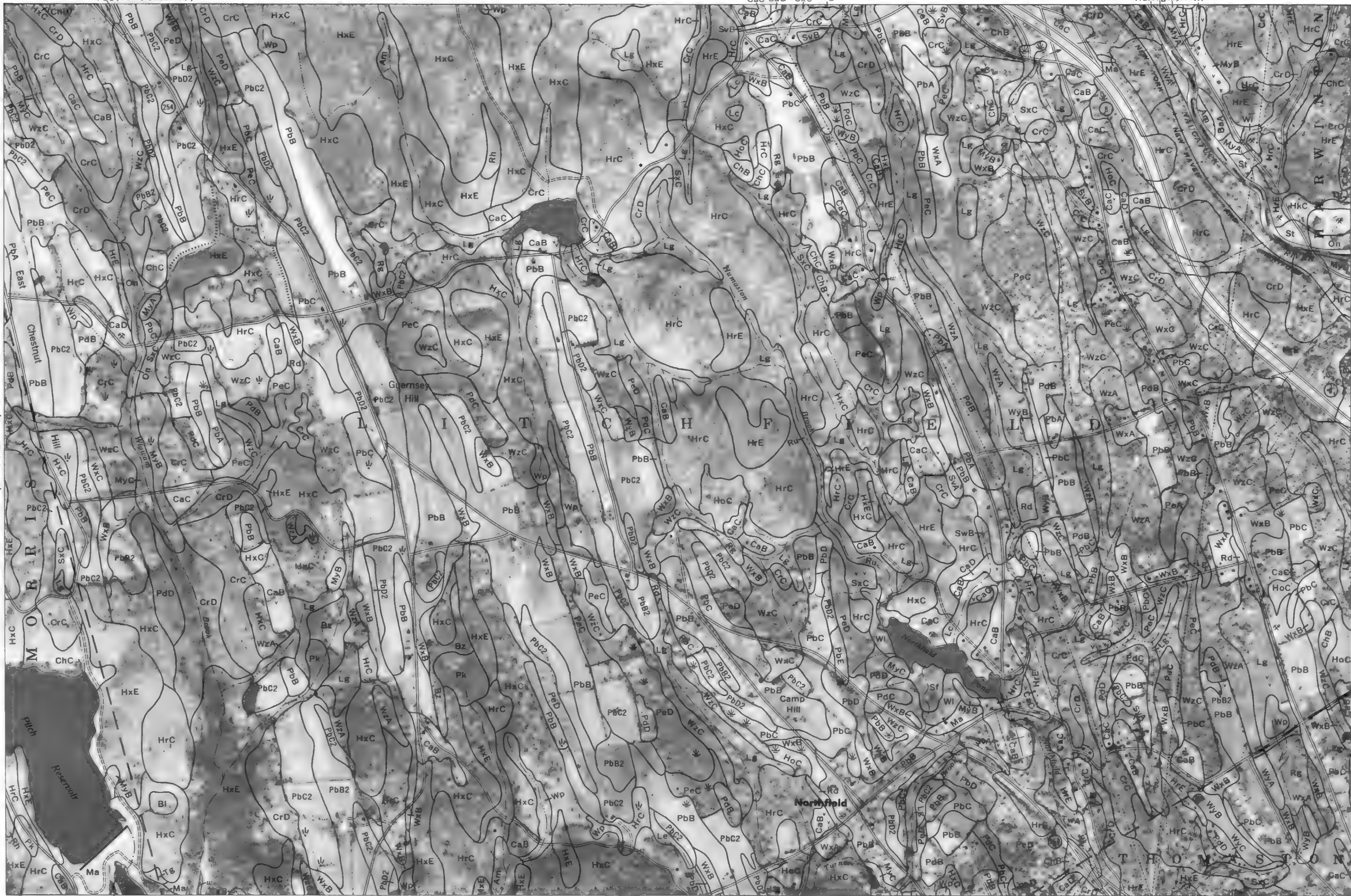
0 1000 2000 3000 4000 5000

PbC (Joins sheet 69)

N

1 Mile
5000 Feet
Scale 1:15840
0 1000 2000 3000 4000 5000
0 ¼ ½ ¾ 1

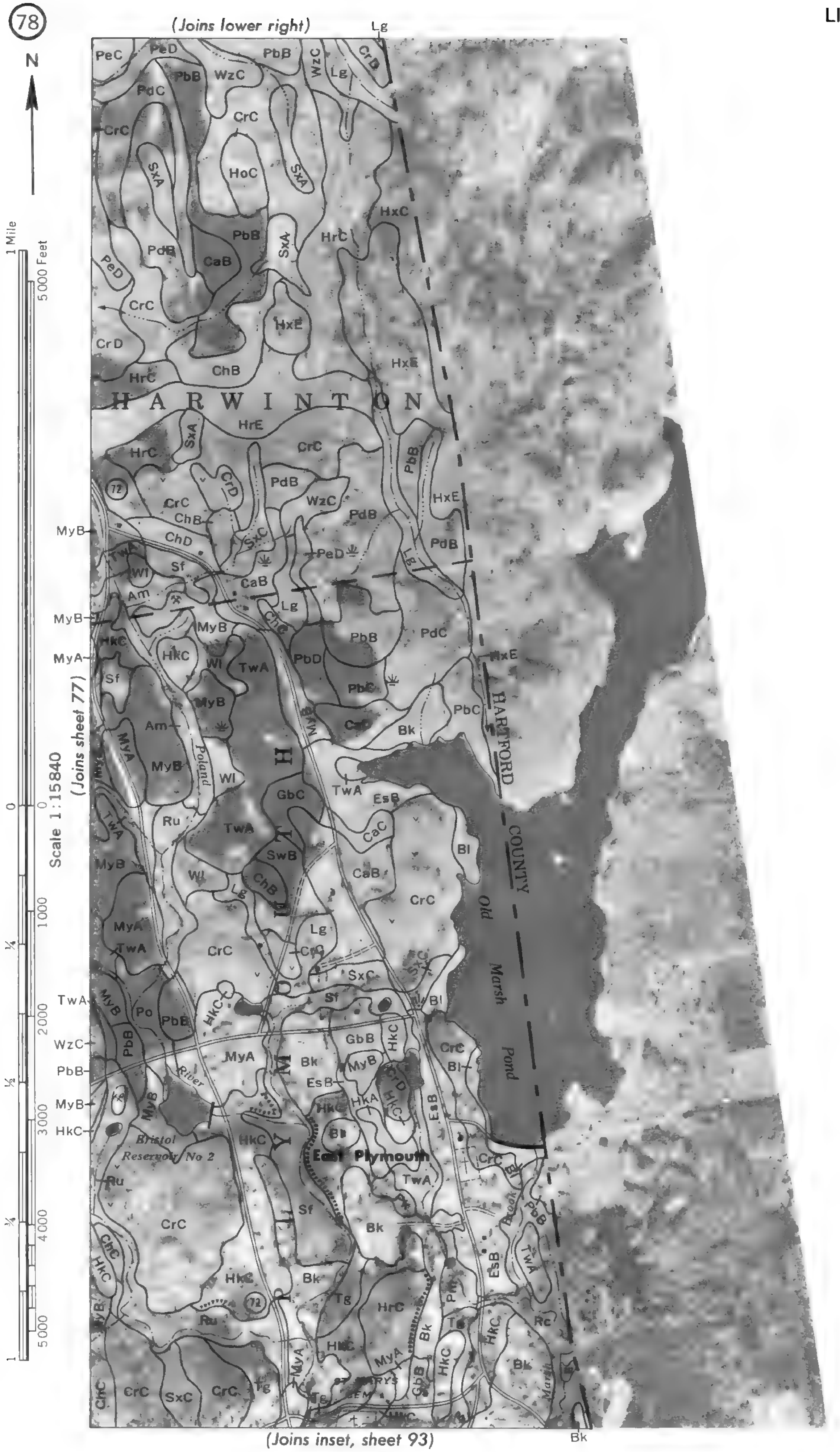
(Joins sheet 75)

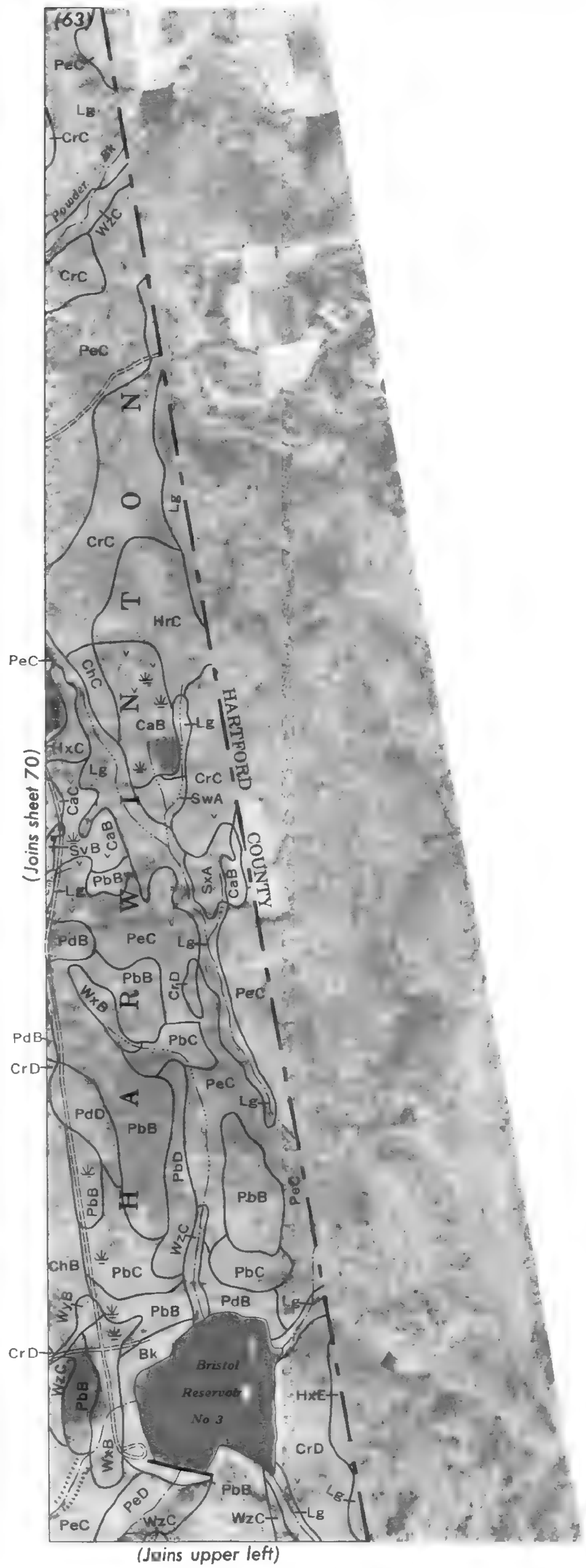


(Joins sheet 77)

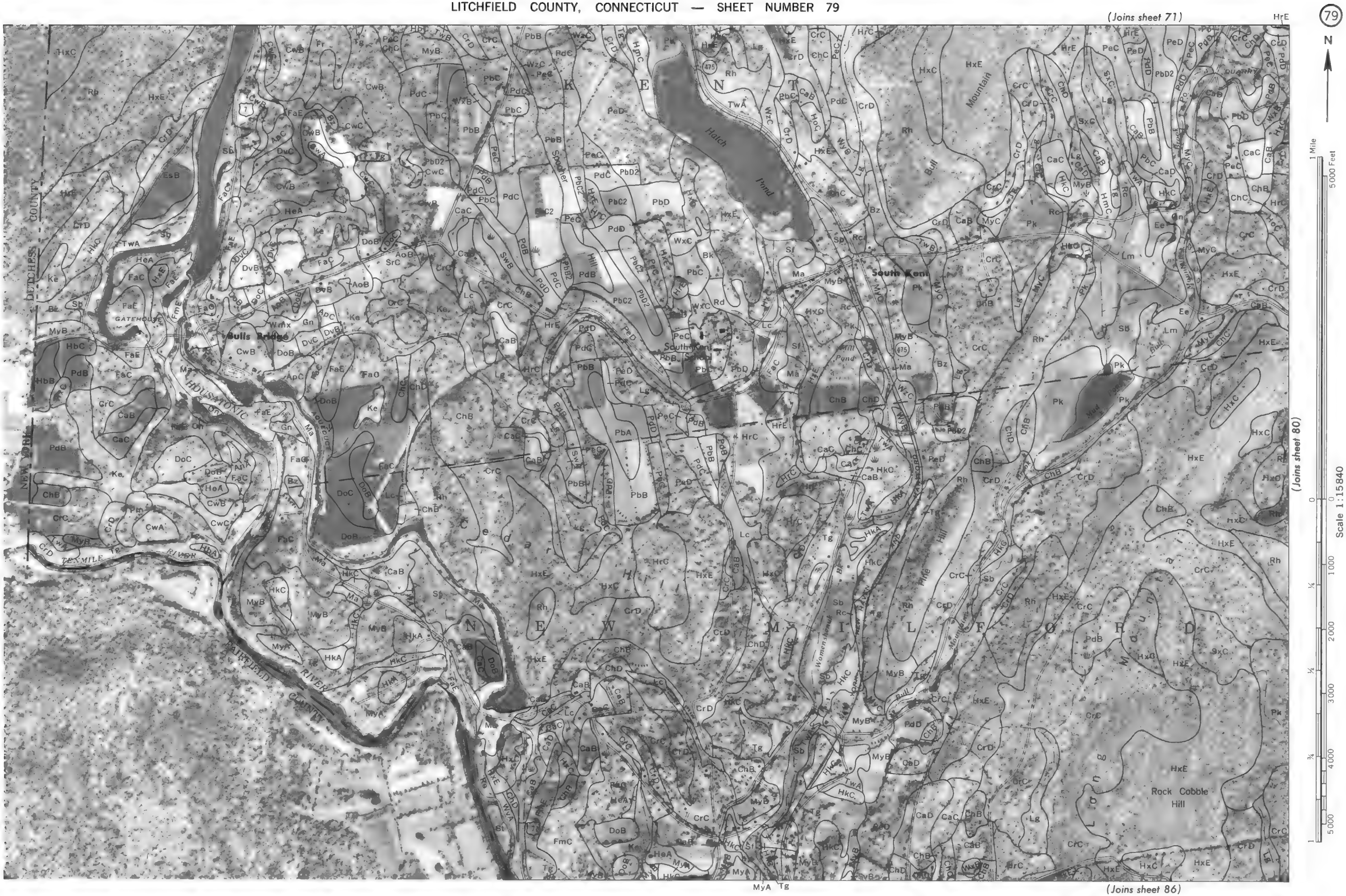
CaC2 (Joins sheet 84)


77
N
(Joins sheet 70)
(Joins sheet 76)
(Joins sheet 78)
(Joins sheet 85)
H A R W I N T O N
L I T C H F I E L D
T H O M A S T O N
P L Y M O U T H
Fluteville
NAUGATUCK
RIVER
NEW YORK
NEW HAVEN
HARTFORD
THOMASTON DAM
Leadmine Brook
Bristol Reservoir No 6
Poland River
Pequabuck River
Minor Pond
Holt School
Holt Hill
Scale 1:15 840
1 Mile
5000 Feet





LITCHFIELD COUNTY, CONNECTICUT NO. 78



LITCHFIELD COUNTY, CONNECTICUT NO. 79

N

1 Mile

5000 Feet

Scale 1:15840

0 ¼ ½ ¾ 1 Mile

0 1000 2000 3000 4000 5000 Feet

(Joins sheet 72)

(Joins sheet 79)

(Joins sheet 81)

(Joins sheet 87)

LITCHFIELD COUNTY, CONNECTICUT NO. 81

(Joins sheet 73)

(Joins sheet 80)

(Joins sheet 82)

(Joins sheet 88)


N
(Joins sheet 74)
(Joins sheet 81)
(Joins sheet 83)
(Joins sheet 89)
1 Mile
5000 Feet
Scale 1:15840
West Morris
Little Mt Tom
Mt Rat
Bantam Lake
South Bay
No Mans Land Swamp
Emmons Pond
Lakeside
Jones Pond
Romford
Camp Washington
Zeiglers Pond
Todd Hill
Shepaug River
Bantam River
Gravel Pit
W A S H I N G T O N
M O R R I S
B E T H L E H E M

N

1 Mile

5000 Feet

Scale 1:15840

0 1000 ¼ 2000 ½ 3000 ¾ 4000 5000 1

LITCHFIELD COUNTY, CONNECTICUT NO. 84


85
(Joins sheet 77)
(Joins sheet 84)
(Joins inset, sheet 93)
(Joins sheet 92)
N
Scale 1:15840
1 Mile
5000 Feet
THOMASTON
Plymouth
Terryville
Reynolds Bridge
NAUGATUCK RIVER
Plymouth Reservoir
Zeiner Pond
Upper Pond
Middle Pond
Terryville Reservoir No 3
Moosehorn Pond
Pratt Pond
McCann Pond
Pine Hill
Town Hill
ST THOMAS CEMETERY
WEST SIDE CEMETERY
NEW HAVEN AND HARTFORD
NEW YORK
Pequabuck River
T H O M A S T O N
P L Y M O U T H

(Joins sheet 79)

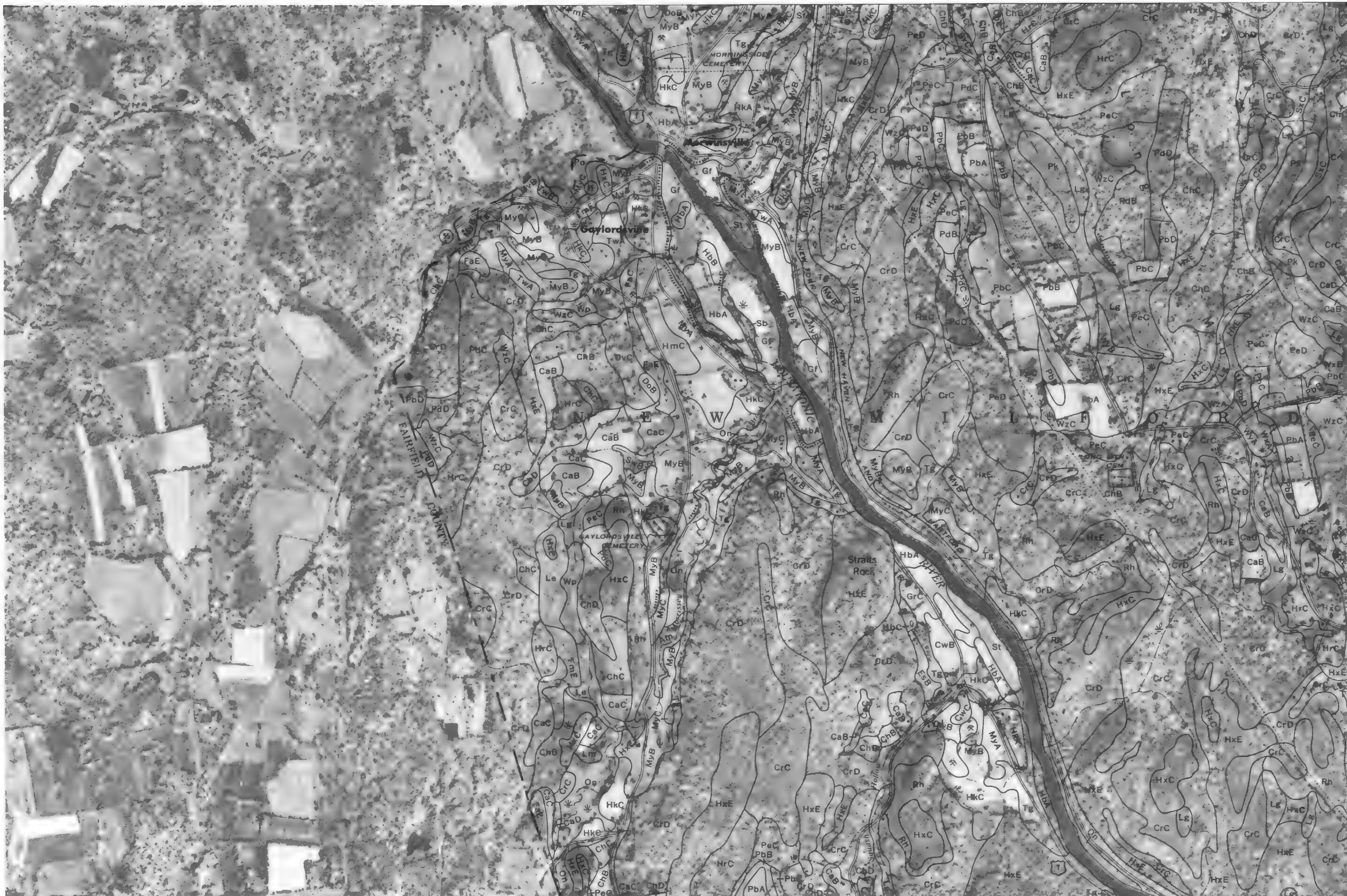
N

1 Mile

5000 Feet

Scale 1:15 840

0 1000 2000 3000 4000 5000

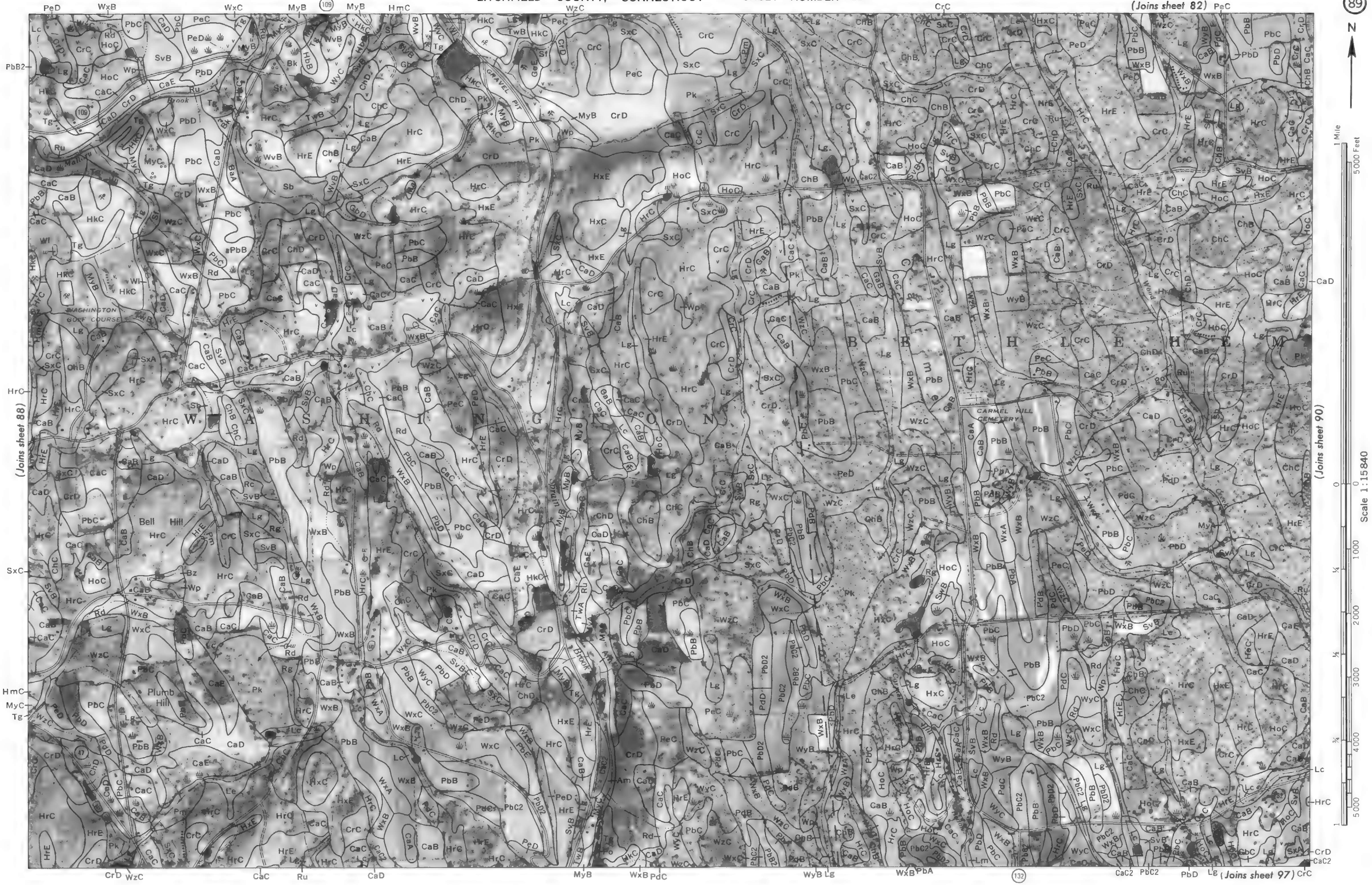


(Joins sheet 87)

(Joins sheet 94)

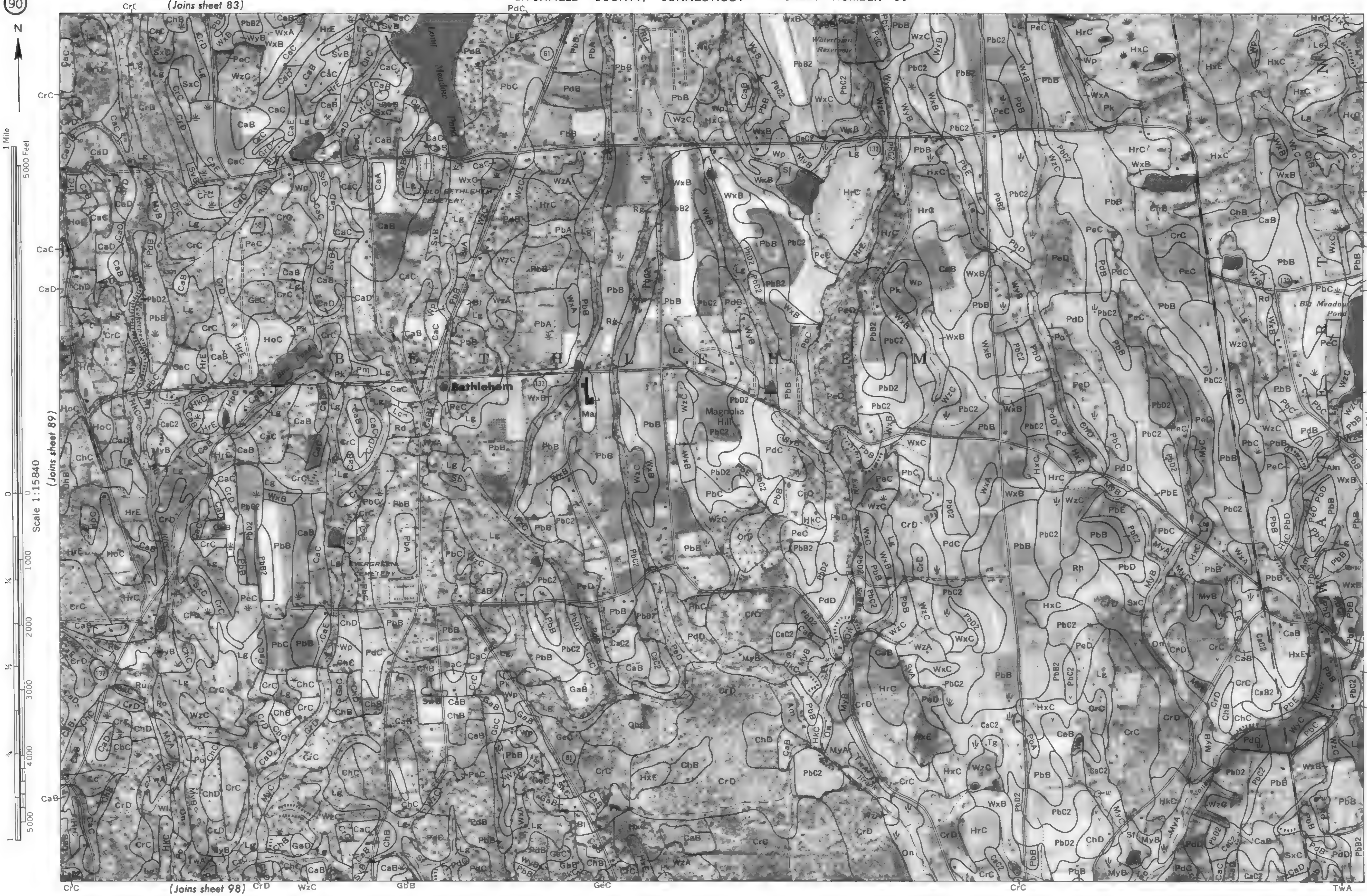
LITCHFIELD COUNTY, CONNECTICUT NO. 87


88
N
(Joins sheet 81)
(Joins sheet 87)
(Joins sheet 89)
(Joins sheet 96)
Scale 1:15 840
1 Mile
5000 Feet
Poplar Swamp
Church Hill
Fenn Hill
Lower Church Hill
Washington Depot
Washington
Gunnery School
SHEPAUG RIVER
W A S H I N G T O N
W O O D B U R Y
Mallory Brook
Kirby Brook


89
N
(Joins sheet 82)
(Joins sheet 88)
(Joins sheet 90)
(Joins sheet 97)
W A S H I N G T O N
B E T H L E H E M
WASHINGTON GOLF COURSE
CARMEL HILL CEMETERY
GRAVEL PIT
Bell Hill
Plumb Hill
1 Mile
5000 Feet
Scale 1:15840
LITCHFIELD COUNTY, CONNECTICUT NO. 89

90

LITCHFIELD COUNTY, CONNECTICUT — SHEET NUMBER 90



LITCHFIELD COUNTY, CONNECTICUT NO. 90


91
N
(Joins sheet 84)
(Joins sheet 90)
(Joins sheet 92)
(Joins sheet 99)
W A T E R T O W N
T H O M A S T O N
Eagle Rock Church
Black Rock Pond
Smith Pond
Lockwood Pond
Pecks Swamp
Hirds Pond
Hannon Pond
MT OLIVET CEMETERY
Brook
1 Mile
5000 Feet
Scale 1:15840
0
1000
2000
3000
4000
5000

N

(Joins sheet 85)

(Joins sheet 91)

(Joins sheet 93)

Scale 1:15840

1 Mile

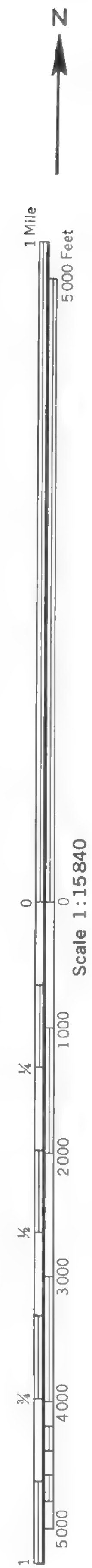
5000 Feet

0 1000 2000 3000 4000 5000

(Joins sheet 100)


(Joins lower right)
(Joins sheet 92)
P L Y M O U T H
Tolles
Buttermilk Falls
Hancock
Lane Hill
Fall Mountain Lake
Fall Mountain
Indian Heaven Pond
Wood Key Hill
Marino Pond
GRAVEL PIT
ALLENTOWN CEMETERY
HARTFORD COUNTY
NEW HAVEN COUNTY


MyA (Joins sheet 78)
(Joins sheet 85)
(Joins upper left)
ST MARYS CEMETERY
Terryville
Pequabuck
ST MICHAEL CEMETERY
Bristol Reservoir No 1
P L Y M O U T H
HARTFORD COUNTY
TERRYVILLE TUNNEL
NEW YORK NEW HAVEN AND HARTFORD
Hancock Brook


N
1 Mile
5000 Feet
Scale 1:15840
0
1000
2000
3000
4000
5000

N

1 Mile
5000 Feet
Scale 1:15840
0 1000 2000 3000 4000 5000
0 ¼ ½ ¾ 1

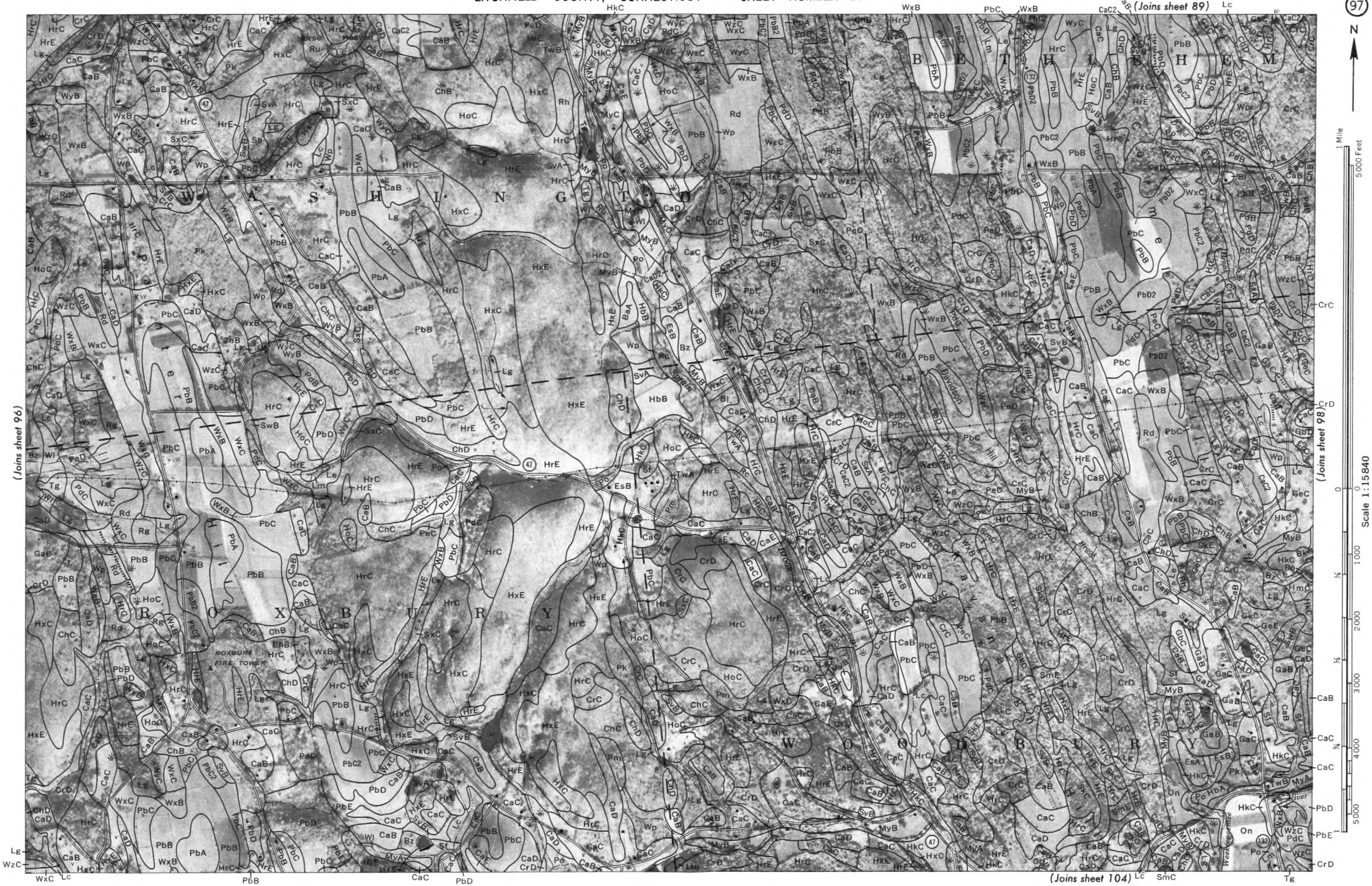
(Joins sheet 86)

(Joins sheet 95)

(Joins sheet 101)


95
N
(Joins sheet 87)
(Joins sheet 94)
(Joins sheet 96)
(Joins sheet 102)
NEW MILFORD
Park Lane
Wellsville
Aspetuck Hill
Canterbury School
New Milford Reservoir No. 1
Reservoir No. 3
Reservoir No. 2
Housatonic River
Wannupee Islands
Aspetuck River
West Aspetuck River
Still River
New York New Haven and Hartford
Scale 1:15840
1 Mile
5000 Feet


(Joins sheet 88)
(Joins sheet 95)
(Joins sheet 97)
(Joins sheet 103)
N
1 Mile
5000 Feet
Scale 1:15840
W A S H I N G T O N
R O X B U R Y
Judds Bridge
SHEPAUG RIVER
The Clam Shell
Steep Rock
GRAVEL PIT


97
N
(Joins sheet 89)
(Joins sheet 96)
(Joins sheet 98)
(Joins sheet 104)
BETHLEHEM
WASHINGTON
ROXBURY
WOODBURY
ROXBURY FIRE TOWER
1 Mile
5000 Feet
Scale 1:15840
0
1000
2000
3000
4000
5000
1/4
1/2
3/4

LITCHFIELD COUNTY, CONNECTICUT — SHEET NUMBER 98

LITCHFIELD COUNTY, CONNECTICUT NO. 98


99
(Joins sheet 91)
(Joins sheet 98)
(Joins sheet 100)
(Joins sheet 106)
N
MT OLIVET CEMETERY
GOLF CLUB
EVERGREEN CEMETERY
ST JAMES CEMETERY
Taft School
WATERTOWN
W A T E R T O W N
W O O D B U R Y
Sperry Hill
Echo Lake
Polk School
Balmoral Farm Pond
Lake Winnemaug
Morehouse Pond
South School
Swift School
OAKVILLE
Scale 1:15840
1 Mile
5000 Feet